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INDEX

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ANALYSIS OF INDEX.

List of Principal Headings in the following Index, with pages on which they may be found.

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10/9/15

	PAGE		PAGE		PAGE
ANNUAL AND EXTRAORDINARY GENERAL MEETINGS AND REPORTS - -	i, ii.	DIVIDENDS - - - - -	ii.	MONTHLY REPORTS - -	iv
CONTRIBUTED ARTICLES - -	ii.	GENERAL INDEX - - -	ii, iii.	QUARTERLY REPORTS - -	iv.
CORRESPONDENCE - - - -	ii.	ILLUSTRATIONS AND MAPS -	iii.	SPECIAL ARTICLES - - -	iv, v.
		LEADING ARTICLES - -	iii, iv.	STATISTICS - - - - -	v, vi.

ANNUAL AND EXTRAORDINARY GENERAL MEETINGS AND REPORTS.

African Farms, Ltd., 463, i.
African Land Co., 484, ii.
Albu Group, 274
Anglo-French Coal Estates, 75, 79
Anglo-German Tin Co., 610
Antelope Gold Mine, 402
Apex Mines, 92
Auckland Park Real Estate Co., 481
Aurora West United, 418, xv.

Bantjes Consolidated, 418, ii.
Betsiriry Proprietary Oil Fields, 650
Brakpan Mines, 66, 384

Cape Asbestos Co., 443
Cassel Coal Co., 145
Chicago Gaika Development Co., 22, 71
Cinderella Consolidated, 418, xiii.
City Deep, 188, 438, iv.
Cloverfield Mines, 418, iii.
Consolidated Langlaagte, 127, 385
Crown Diamonds, 253
Crown Mines, 79, 418, iv.

Durban Roodepoort Deep, 418, ix.

East Rand Deep, 145
East Rand Proprietary, 21, 36, 193, 205
Eileen Alannah, 622
Eldorado Banket, 610
Empress (Rhodesia), Ltd., 18

Geduld Proprietary Mines, 69, 292
Geldenhuis Deep, 191, 438, i.
General Mining & Finance Corporation, 508, i.
Ginsberg G.M. Co., 128, 388
Glencairn G.M. Co., 123
Glencairn Main Reef, 390
Goerz & Co., 508, viii.
Golden Kopje Mines, 623, 640
Government Areas, 389
Groenfontein Tin Mine, 164

Imperial Cold Storage, 338

Johannesburg Chamber of Commerce, 234
Jupiter G.M., 69, 145

Knight Central, 189, 438, ii.
Kolmanskop Diamonds, 66

Leeuwpoort (African Farms) Tin Mines, 450, 463, v.
Leydsdorp Mica, 443
Lomah (Rhodesian) Exploration, 622
Lonely Reef G.M. Co., 253

Meyer and Charlton, 418, xii.
Modderfontein "B," 162, 418, i.
Modderfontein Deep Levels, 68, 291
Mozambique Macequece, 603

Namaqua Copper, 210
Natal Bank, 26, 233
New Era Consolidated, 382
New Goch Gold Mines, 418, xvi.
New Heriot G.M., 12
New Kleinfontein, 80
New Primrose G.M. Co., 125, 387
New Rietfontein, 128, 388, 571
New Rhodesia District Development, 654
New Steyn Estates, 418, xviii.
New Unified Main Reef, 119, 386
Nigel G.M. Co., 192
North Charterland & Exploration Co., 282
Northern Transvaal Lands, 379

Oceola Gold Mine, 640

Potchefstroom Exploration Co., 471

Rand Collieries, 418, xvii.
Rand Mines, Ltd., 438, vi.
Rand Water Board, 519
Randfontein Central, 54
Randfontein Estates, 55
Randfontein Langlaagte Group, 34
Rezende Mines, 488
Rhodesia Chamber of Mines, 70
Rhodesia Consolidated, 654
Rhodesia Copper Co., 605
Rhodesia Gold Mining & Investment Co., 330
Roberts Victor Diamonds, 250
Robinson Deep, 484, i.

S13
v.23
no.2

Robinson Gold Mining Co., 109, 273, 508, vii.
Robinson Group, 54
Rooiberg Minerals, 649
Rose Deep, 190, 438, iii.

Sacke Estates, 418, xvii.
Shamva Mines, 618
Simmer Deep G.M., 143
S. African Association of Analytical Chemists, 498
S. African Copper Trust, 567
S. African Gold Mines, 210, 463, vi.
Springs Mines, 382
Standard Bank, 51, 289
Stavoren Tin Mining Co., 195

Tati Concessions, 18, 168
Transvaal Chamber of Mines, 13
T.C.L., 163, 508, iv.
Transvaal Coal Trust, 64, 383
Transvaal Estates & Development 395
Transvaal G.M. Estates, 497
Transvaal Lands, Ltd., 60
Transvaal & Rhodesian Estates, 282
Thistle Etna Gold Mines, 501

United Jack G.M. Co., 123

Van Ryn Deep G.M., 125, 388
Vereeniging Estates, 146
Village Deep, 162, 418, viii.
Vogelstruis Deep, 418, iii.

Welgevonden Tin Mine, 455
Witwatersrand Deep, 381
Witwatersrand G.M. Co., 386
Witwatersrand Township, 463, vii.
Wolhuter Gold Mines, 142
Worcester G.M. Co., 63

York G.M. Co., 147

CONTRIBUTED ARTICLES.

Accident Prevention at an American Mine (Duncan), 176
Accident Prevention in Mining (Ryan), 249
Application of Efficiency Methods to Mining (Leonard), 281

Cast Iron vs. Steel Pipes (Special Correspondent), 257
Certificates of Competence (Anonymous), 37
Concentration of Diamondiferous Ground, as applied at De Beers (Stewart), 220, 254
Crown Mines Reduction Plant, The (Correspondent) 119

Economic use of Workmen on the Rand (Way), 562, 583, 604, 625, 641
Electric Blasting in Shafts with delay action Explodes (Morse), 50
Electric Traction in Mines (Le Grand), 231
Exudation of Nitro-Glycerine (Cullen), 621

First Cost and Final Cost (Special Correspondent), 286, 313
Flying Train, The (Special Correspondent), 335

Graphite Coated Diamonds from the Premier Mine (Wagner), 419

Labour and the Colour Question in S. Africa (Blane), 93

Mining Activities in the Pietersburg District (Correspondent), 61
Mining as a Profession (Jennings), 581

Oil Shale Mining (Kellock Brown), 130, 154, 194

Petroleum Deposits of S. Africa, The (Cumming), 537, 560

Recent American Machine Design (McDonald), 285
Recent Progress of Industrial Hygiene (Luther), 447
Relation of Geology to Mining (Hatch), 221, 247, 278
Rock Temperatures in the Mines of the Rand (Moynihan), 333, 407

Skefko Self Acting Ball Bearing (Correspondent), 354
Standardisation of Mining Accounts, The (Hewitt), 476
State aid to Mining in other Mining Countries (George), 272

Ventilation of the Mines on the Rand (Blenkinsop), 90

CORRESPONDENCE AND DISCUSSION.

Cheap Labour, The fallacy of, 328
Discovery vs. re-location, 406

Economics of Citrus Growing, 499, 566, 606, 651

Exudation of Nitro Glycerine, 651

First Aid vs. Safety First, 309, 372, 430
Folakara Oil, Progress of, 512

How to Exploit the Outside Districts, 223

Insurance Questions at issue, 566

Leeuwpoort Tin Dressing Plant, 516
Lot of the Rand Mining Student, The, 41

Madagascar Conditions, 309
Mine Claim Areas, 566
Mining in the Murchison Range, 197
Mining Reforms, 606

National Diamonds, 41
Native Labour Recruiting, 197

Plight of the Prospector, The, 198

Refractory Ores, 27

"Safety First," 406
Sakalava Madagascar Proprietary Oil Fields, 129
Sakalava Meeting, The, 95
Shall the Tin Mines Close Down ? 499
Shortcomings of the Prospector in S. Africa, The, 167, 197, 223, 252
South African Investments, 309

Tin Shareholders' Thanks, 516

War Relief Funds and Scientific Societies, 651
What is wrong with S. African Mining ? 95, 129, 223, 224
What Rand Mining owes to Geology, 252

DIVIDENDS.

Durban Roodepoort G. Mines, 369

Fraser & Chalmers, 610

Glencoe Collieries, 481
Globe & Phœnix G.M. Co., 578

Premier Diamonds, 173

Sheba G.M. Co., 428

Transvaal Gold Mining Estates, 63, 101

GENERAL INDEX.

Accident at the Globe & Phœnix Mine, 501
Accident Prevention and the Mining Exhibition, 252
Agnes Gold Mine, The, 584
Alaska Mexican G.M. Co., 538
Alaska Treadwell G.M. Co., 538
Alaska United G.M. Co., 538
Asbestos in Rhodesia, 97

Books Reviewed—

"Copper Handbook, 1914," The, 92
"Mines of Africa," 1914-15, 549
"Mining Manual," The, 80
Banking Supplement, 572, i.
Bell Mine, 40
Bloemhof Fields' New Rush, 525
Boksburg Trackless Trams, 338
Breaking of Drill Steel, The, 336
Bucks Reef, 97
Bulawayo Discovery, A new, 584

Cam and Motor Mine, 18, 199
Chinavane Railway, The, 548
Citrus Growing, Sir Percy Fitz-Patrick on, 570
Coal Contracts, 298
Commerce and the War, 660
Congo Mining, 40
Connemara Mine, The, 71
Crisis and the Mining Market, 648

De Beers, Conditions at, 89, 549
De Beer's Employees, Three Months Work for, 660
Del Monte Process of Coal Distillation, The, 525
Diamond Convention, 596
Diamonds near Ventersdorp, 565
Diamonds at Aliwal, 598
Directors in Court, 621
Droogveld and Bloemhof Diamonds, 583

Eiffel Blue Mine, 640
Eight Hours Day, The, 549
Eileen Alannah Mine, 584, 640, 654
Eldorado Banket, 640, 654
Electric Light for Farms, 550
Electricity in Mines, 137
Eldorado-Kafue Railway, 477
Empress Mine, The, 622
Explosives Companies' Profits, 463

Falcon Gold Mine, 477
Farming in S. Africa, 548
Folakara Oil Fields, 482
Form for Missed Hole Reports, 372
Frank Smith Diamonds, 612
Free State Diamonds, 449
Fruit Growing Potentialities, 462

Gaika Gold Mine, 40
Geduld Proprietary Mines, 332
German African Shipping, 628
Giant South Mine, The, 622
Glen May (Rhodesia) Mines, Ltd., 477
Globe & Phœnix Mine, The, 71, 330
Government Securities for the Small Investor, 26
Government Supplies, 612

Hanover G.M. Syndicate, 71
Health on the Mines, 501
Heroine G.M., 40

Kambanje Mine, The, 477
King's Asbestos Mine, 402
Klerksdorp Proprietary, 370
Kynoch's Increased Dividend, 527

Labour and the Commercial Position, 242
Lapsed Claims in Pilgrim's Rest District, 277
Leaching of Copper Ores in Africa, 117
Legal Decision affecting Mining, 268
Lewis & Marks' Farms open to Prospectors, 471
Liebegs and Rhodesia, 482
Lisbon Berlyn closed down, 659
Lomah (Rhodesia) Exploration Co., 71

Main Reef West, 369
Marievale Nigel, 78
Meat Supplies of the World, 233
Mine Accident Statistics, 302
Mines withdrawn from the Phthisis list, 558
Miners' Phthisis Compensation Applications, 496
Mozambique Economics, 139
Municipal Debts, 526

Natal Coal Freights, 76
Natal Rubber Industry, The, 233
Natal Sugar Ring—Ultimatum? 628
Nelspruit-Graskop Railway, 371
Netherlands Trade with South Africa, 259
New Cape Central Railway, 527
New Mining Concession in Belgian Congo, 127
New Native Labour Regulations, 492
Northern Transvaal Copper, 84
Novel Change House, A, 185

Ocean Freights, 413
Ocean Freights on Iron and Steel Bars, 526
Oil Resources of the Empire, The, 516
Oleander Mine, The, 402
Origin of the Diamond, The, 550
Origin of Rand Gold, 579
Ostriches and Sheep Farming, 26
Otavi Mines and Railway, 563

Planet Arcturas, 584
Ponds Gold Mine, The, 584
Portland Cement Industry, The, 139
Power for the Victoria Falls Power Co., More, 626
Premier Mine Position, The, 628
Prospector's Action against Apex Mines, 186

Railway Budget, The, 259
Railway Rates on Asbestos, 477
Ranching in the Transvaal, 202
Rand Produce Trade, 413
Rand Water Board New Scheme, 377
Rhodesia Gold Mining & Investment Co., 251
Rhodesia and the Customs' Union 570
Rhodesia Mines Trust, 540
Rhodesia Museum, The, 453
Rhodesia Budget, 225
Rhodesian Mines and Minerals Ordinance, 97
Rhodesian Native Labour Question, 641
Rhodesian Railways, 138
Rhodesian Railway Progress, 463
Rietkuil Property, 80
Royal Commission on Metalliferous Mines and Quarries, 582
Rustenburg Cotton Jinnery, 526

Sabiwa Mine, 131
Sakalava Madagascar Proprietary Oil Fields, 400, 607
Selukwe G.M. Co., 567
Seta Diamonds, 563
Shamva Mine, 18, 71, 131, 225, 330, 447, 654
Small Workers and the Customs Tariff, 521
Solomon's Temple Farm, Sale of, 528
South African Coal and the Indian Trade, 289
South African Whaling Industry, The, 177
Stock Exchange Values, 377
Sub Nigel, 36
Supply of Sulphur to Farmers, 611
Susanna Mines, 540
Swaziland Progress, 484

Tati Company, Ltd., 199
Thistle Etna Gold Mines, 454
Trade of German Togoland, 660
Transkeian General Council, Proceedings of the, 599
Transvaal Gold Mining Estates, 17
Transvaal Gold Trust, 412

Utilization of Solar Energy, The, 307
Union Coal Rates, 570
Union Miniere, 567
Union Mint, The, 616

Vaal River Gold Fields, Ltd., 370

Wanderer (Selukwe), 521
Wankie Colliery, 40
Warwick Patent Condenser, The, 567
Water Fed Hammer Drills, 488
What the Government draws in Claim Licences, 305
Wheat Resources of South Africa, 105
World's Fair on the Rand, 481

ILLUSTRATIONS.

Butter's Filter House Tanks Modder Govt. Areas, 303

Dredge of the Andrade Mines Portuguese E. Africa, 424

Indimba (Swaziland) Tin Mine, Views of, 559

Johannesburg Show Ground, 203

Leeuwpoort Tin Mine, Views of, 563

Messina No. 5 Shaft, 9
Mines Dept. Accident Museum, 341
Modder B New Recreation Hall, 87
"Myers-Whalley" Shovelling Machines, 639

"Safety First" Devices, Various, 343, 345, 347
Skefko Ball Bearing, The, 354

Transport Underground, Crown Mines, 85

GROUPS.

Joint Staff of the Cons. Main Reef Mines and Estates and Main Reef West, Ltd., 155

Manager and Staff of the Bantjes Consolidated, 581
Manager and Staff of the Brakpan Gold Mines, 7
Manager and Staff of the City Deep, New Circular Shaft, 561
Manager and Staff of the Dynamite Factory, Modderfontein, 365
Manager and Staff of the Knights Deep, Ltd., 219
Manager and Staff of the Modder B Gold Mine, 399
Manager and Staff of the New Circular Shaft, Crown Mines, 367
Manager and Staff of the New Unified Main Reef G.M. Co., 91
Manager and Staff of the Nigel G.M. Co., 425
Manager and Staff of the Simmer Deep, Ltd., 245
Manager and Staff of the Simmer and Jack Proprietary Mines, 301
Manager and Staff of the Springs Mines, Ltd., 471
Manager and Staff of the Sub Nigel, Ltd., 329
Manager and Staff of the Village Deep G.M., 537
Manager and Staff of the Village Main Reef G.M. (Underground) 637
Manager and Staff of the Van Ryn Deep, 490
Manager and Staff of the West Rand Consolidated Mines, 515

MAPS AND PLANS.

Geological Sketch Map of Madagascar, 579

Map of Madagascar Oil Fields, 535
Map of Rhodesia's Coal Fields, 99

Sketch Map of German East Africa showing Gold Occurrences, 617

LEADING ARTICLES.

Albu Group, The Year with the 393

Bailey Group, The, 441
Barnato Mines, Progress of the, 359
Budget and the Mining Industry The, 242

Campaign against Mine Accidents, The, 60
"Chapman Report" on our Industrial Problem, 3
"Colour Bar" and the Government, The, 265, 297
Consolidated Mines Selections Subsidiaries, The, 359
Crisis, Some Lessons of the, 576
Crown Mines Meeting, The, 394

Diamond Mines New Arrangement, 648
Dominions Commission Report, The, 531
Dominions Commission and the Food Supply, 596
Dominions Commission on Rand Problems, The, 616

Financial and Industrial Outlook, The, 595
Four Central Mining Subsidiaries, 394

General Mining and Finance Meeting, The, 487
Gold Mining and the Generalization Fallacy, 3
Gorgas Report on Rand Mine Sanitation, The, 116
Government and the Future of the Far Eastern Rand, The, 324
Government and the Life of the Rand, The, 31
Great Rand Show, The, 183

Hygiene in Mines, 184

Improving Hygiene Conditions Underground on the Rand, 44
Industrial Betterment Committee for the Rand, An, 556
Industry and Business as Usual, 631
Industry Officially Reviewed, The, 83

"Kimberlization" and the Colour Bar, 115

Mine Employers Registry, A, 152
Mine Labour, The Problem of, 555
Miners' Phthisis Compensation Methods, 298
Mines, Commerce and the War, The, 647
Mining Exhibition, The, 323
Money Outlook, The, 532
More Views of the Life of the Mining Industry, 115

Natives' Pay and Opportunity on the Mines, The, 4
New Industrial Legislation, The, 241
New Jagersfontein, Position and Prospects of the New, 488
New Problems of Organized Labour, The, 84
New Tariff, Local Industries and Cost of Living, 297
New Workmen's Compensation Bill, The, 124

Outlook, The, 575
Outlook for the Mines, The, 59

Platinum and Trickery, 442
Position and Prospects of the Goerz Group, 286
Progress of the Dust and Anti-Phthisis Campaign, 83
Progress of Events, The, 615
Progress of the National Bank, 383

Rand Mines Year, The, 421
Rand Native Grievances, 511
Rand "Safety First" Campaign, 615
Rand Values in Depth, 422
Rand Unification: Pros and Cons, 161
Reorganisation of Native Labour on the Mines, The, 31

"Safety First" Progress, 512
Share and Metal Market Outlook, 432
Should Our Tin Mines Close Down? 467
South African Institution of Engineers and the Industry, 241

Transvaal Landowners' Activities, 213
Tuberculosis and Miners' Phthisis, 478
Tyranny of Trade Unions, The, 3[illegible]

Year with Rand Trade and Commerce, The, 214

MONTHLY REPORTS

Albu Group, [illegible], 47, 172, 284, [illegible], [illegible], 518, 607
Antelope Gold Mine, 33[illegible]

Barnato Group, 11, 47, 171, 284, 432, 518, 607
Blaauwbosch Diamonds, 164, 277, 398, [illegible], 543, 627
Brakpan Mines, 22, 172, 312, 428, 519, 606

City & Suburban, 172, 186
Companhia de Mocambique, 133, 246, 388, 470, 579
Consolidated Gold Fields Group, 47, 172, 284, 432, 518, 607
Crown Diamonds, 22, 51, 154, 278, 450

East Rand Proprietary Mines, 47, 64, 105, 284

Frank Smith Diamonds, 22, 218, 267, 415, 515

Globe & Phoenix Mine, 225, 477, 567
Glynn's Lydenburg, 9, 167, 198, 319, 425, 520, 539, 618
Goerz Group, 47, 171, 284, 432, 518, 619
Gong Gong and Keiskama Diamonds, 463

Heroine Gold Mine, 90

Lonely Reef G.M. Co., 40, 209, 318, 463, 584, 619
Luipaardsvlei Estate, 39, 154, 278, 429, 520

May Consolidated, 273
Messina (Transvaal) Development, 89, 194, 327, 445

Neumann Group, 47, 172, 312, 433, 519, 619
New Heriot, 161
New Kleinfontein, 312
New Vaal River Diamonds, 598, 636
Nigel G.M. Co., 47, 305, 428, 455, 518, 619

Pickstone Mine, 168, 282, 453, 567
Piggs Peak, 423
Pniel Diamonds, 267

Rand Mines Group, 46, 172, 284, 432, 518, 607
Rezende Mines, 40, 199, 308, 338, 433, 477, 540, 622
Rhodesia Chamber of Mines, 168, 434, 510, 605
Roberts Victor Diamonds, 247, 268, 424, 519, 542, 612
Robinson Group, 47, 312, 433, 619
Rooiberg Minerals Development Co., 161, 319

Sabiwa Mine, 18, 199, 640
Sheba G.M. Co., 37, 289, 423, 520, 619
South African Option Syndicate, 447
South West Transvaal Diamond Diggings, 247, 368, 484
Springs Mines, 519
Star of Rhodesia, 39
Susanna Mine, The, 71, 199
Swaziland Tin, 96, 235, 443, 528, 565

Transvaal Chamber of Mines, 452
Transvaal G.M. Estates, 10, 172, 190, 290, 423, 520, 628

Wanderer Mine, 168, 282

Zaaiplaats Tin, 191, 318, 433, 528

QUARTERLY REPORTS.

Antelope G.M., 225, 251

Brakpan Mines, 218, 606

Consolidated Langlaagte, 638
Consolidated Main Reef, 340, 631

Durban Roodepoort Deep, 340

East Rand Proprietary Mines, 443
Eldorado Banket G.M. Co., 251

Falcon Mines, 251
Ferreira Deep, 318, 653

Gaika G.M. Co., 225
Geduld Proprietary, 312, 633
Glynn's Lydenburg, 473
Golden Kopje Proprietary Mines, 540

Knight Central, 304

Langlaagte Estate, 305, 380

Main Reef West, 300, 631
Modderfontein "B", 378

National Diamonds, 400
New Kleinfontein, 218
New Modderfontein, 380
Nourse Mines, 14, 380

Princess Estate & G.M. Co., 268, 618

Randfontein Central, 318, 380
Rezende Mine, 71
Rhodesia Chamber of Mines, 308
Robinson G.M. Co., 10, 380, 649
Rooiberg Minerals Development Co., 269
Rose Deep, 380

Springs Mines, 222

Transvaal Chamber of Mines, 452

Village Deep, 327

Witwatersrand Deep, 318, 631
Wolhuter Gold Mines, 425

Zaaiplaats Tin, 433

SPECIAL ARTICLES.

Accident Prevention Devices already adopted, 348
Action of Acid Mine Water upon Electric Insulation, 337
Activity in the Pilgrims Rest Area, 423
Advertising Oil in Madagascar, 12
African Banking Corporation, 572 xvi.
Agricultural Machinery at the Rand Show, 203
Analysis of the Rand's Outsanding features in 1913, An, 221
Annual Report of the Secretary for Mines and Industries, 326
Annual Review of Rand Mines, Ltd., 187
Assay of Tin Ores, The, 72

Bantjes, Position at the, 161
Barnato Group, Progress of the, 492, 620
Barnato Group Subsidiaries, 35
Big Profits from one and a half Dwts. Ore, 121
Big Steel Corporation and its Employees, A, 401

Cape Tin Floatation, A, 61
"Capital Account," The true functions of the, 426
Care and Protection of Wire Ropes, The, 316
City Deep's strong position, The, 268
Coal Industry of the Union, The, 470
Coal Mines Rescue Stations, 480, 524
Coal Resources of the Union, 634
Colonial Banking & Trust Co., 572, xix.
Cost of South African Commission The, 17
Crown Mines Circular Shaft, The, 397
Crown Mines Report, The, 157

Deposits near Cape Town, The, 428
Development of Oil Resources, The, 514
Development of Tube Mill Linings, The, 315
Development Work, Restriction of, 120
Development of South African Resources, The, 623
Developments at the Wolhuter, 39
Diamond Market, The State of the, 599
Dominions Commission and Rand Mining Conditions, 196
Dominions Royal Commission Report, The, 601
Durban Roodepoort Deep, A Year with the, 161
Dynamite Accidents and the "Safety First" Campaign, 370

Economic Possibilities of German East Africa, 617
Economic use of Workmen on the Rand, 562, 583, 604
Economics of Voorspoed Mine Operations, The, 248
Electrical Accidents, 637
Electrical Power and Light on South African Farms, 229
European View of S. African Mining, A, 361
Evils of the Present System of Native Recruiting, 159
Exploitation of Big Low Grade Deep Levels, 195

"First Aid" and Ambulance Competitions, 193
"First Aid" on the Mines of the Rand, 366
Fissure Coals of the Western Province, 533
Floatation of the Folakara Oil Fields, 300
Foundations of the "Colour Bar," The, 277
French Foreign Bondholders and Rand Companies, 35
Further East Rand, Progress at the, 153
Further facts about Germany's African Colonies, 635

Geological features of the Central Congo, 248
Geology of German S. West Africa, 650
Gold Dredging in Southern Africa, 424
Gold Resources of the British Empire, 633
Government Area's Profit Prospects, The, 513
Group Profits in June, 520

Half Year's Dividends, The, 443, 469, 489
Hammer Drills in Barnato Mines, 118
Harrisdale Syndicate Tin Property, The, 65, 118
Hygienic Aspects of the Mining Industry, 160
How War may affect Rand Industry, 577

Incidence of the Income and Land Taxes, 279
Increasing use of Electricity on the Rand, 639
Increasing use of Oil Engines in South Africa, 205
Individual Mines and Improving Returns, 325
Industrial Betterment Activities in the U.S.A., 563
Irrigation in South Africa, 205

Knight Central, 578
"Knights" Record Year of Prosperity, 122

Labour Efficiency on the W.W. Rand, 363
Labour Party and Taxation of Land Values, The, 126
Law Reports affecting Mining, 475
Local Industries and the S.A. National Union, 451

Madagascar Oil Fields, 62, 579
Madagascar Oil Floatations, 448, 535
Making of Mine Models as a Technical Question, The, 272
Manambolo Oil Syndicate, Floatation of the, 539
May Consolidated, Life of the, 72
Messina Copper, 543
Messina Company's Twin Shafts, The, 9
Metallurgical Progress on the Rand, Decrease of, 546
Mine Models and their uses, 218, 401
Mine Rescue Stations Rules in Great Britain, 609
Mine Safety Committees for the Rand? 362
Mine Safety Rules selected, classified and condensed, 353
Mineral Development in the Victoria District, 270
Mineral Prospects in Southern Rhodesia, 536
Miners' Union makes a "dead set" on Randfontein, The, 299
Mining Exhibition, Notable Displays at the, 371
Mining Progress in Belgian Congo, 132
Mining Position in Madagascar, The, 427
Mining Situation in Rhodesia, The, 244
Modderfontein Government Areas Progress at the, 117, 303
Modderfontein Mines and the Van Ryn Deep, The, 557
Modder B New Equipment Completed, 580
Motor Fuel Question in South Africa, The, 207
"Myers-Whaley" Shovelling Machine, 639

Natal Bank, The, 572, xvii.
Natal Coal Industry, The, 122
Natal Mining & Prospecting, 6
National Bank of South Africa, 572, xii.
Netherlands Bank, The, 572, xix.
Neumann Group, Progress of the, 534
Nigel, Position at the, 364

Orcharding Prospects in Tasmania 124
Outlook in the Tin Market, The, 396
Output and Profits, 582

Pattern Tin Dressing Plant of the Transvaal, The, 493
Permitted Explosives, 378
Pietersburg Goldfields Activity, 325
Pilandsberg Diamonds, 271
Position of the Messina Development Co., 517
Position and Prospects of the Rhodesian Land Bank, 572, xx.
Position of the Transvaal G.M. Estates, The, 14
Prevention of Mine Accidents on the Rand, The, 352
Products of the South African Alkali, Ltd., The, 356
Progress of Mining in Rhodesia, 269
Progress of Tin Mining in the Transvaal, 243
Progress of the "Safety First" Movement, 63
Progress of Messina Copper, 300
Proposed new Industrial Legislation, 15
Prospecting Permits and Claims, 366

Question of Tyres in South Africa, The, 208

Radium, Prospecting for, 68
Rand Gold Mines in 1913, 38
Rand Recovery Value Calculations, 470
Rand's 1914 Gold Output, The, 398
Rand's Deepest Mines, The, 243
Rand's New Mills, The, 187
Rand's Ore Reserves, The, 215, 246
Randfontein Estates, Position of the, 533
Recent Contributions to South African Science, Some, 547
Recent Progress in Rand Metallurgical Practice, 446
Refractory Ores in the Transvaal, 185
Report of the Economic Commission, 16
Resuscitation from Electric Shock, 517
Rhodesia Gold Mining & Investment Co., 280
Rhodesian Geological Survey, 331, 373, 405
Rhodesia's Coal Resources, 98
Rhodesia' New Producers, 132

"Safety First" and the care of the Eyes, 347
"Safety First" Campaign on the Rand, 342
"Safety First" Competitions, 346
"Safety First," History, Aims and Progress of the Movement, 344
"Safety First" Movement in the U.S.A., 600
"Safety First" Prevention of Accidents, 638
"Safety First" Prizes, Offers of, 87
"Safety First" Publications of the Committee, 349
"Safety First" Winding Devices, 345
"Safety First" World Wide Progress of Movement in Mines, 351
Sand Filling at the Wit Deep, 192
Security of the Rand's Underground Workings, 217
Shaft Sinking at Daggafontein, 326
Sheba, Position and Progress of the, 167
South African Association of Analytical Chemists, 474
South African Banking Progress, 572, i.
South African Bank Clearing Returns, 572, xviii.
South African Bank Shares as Investments, 572, v.
South African Banks and the Gold Reserve Question, 572, xi.
South African Bankers Symposium, 572, ix.
South African Paper Currency Law Reforms, 572, vii.
South African Railway Tours, 236
South African Survey Practice, 302
South African Tin Industry, The, 559
Stamp Duty in May, over Nine Tons, 516
Standard Bank of South Africa, 572, xiv.
State Owned Mining Areas, The, 444
Steel Trust and Welfare Work, 564

Tin and Copper Mining in the Transvaal, 186
Tin and Copper Prices, 306
Tin Prices, The Outlook for, 496
Transport of Ore Underground, The, 85
Transvaal Mining and the Panama Pacific Exposition, 494

Underground Contracts vs. Day's Pay at De Beers, 368
Unification of the Rand Mining Industry, The, 165
Union Laws affecting Commercial Travellers, 417
Union's New Taxation, 270
Use of Rescue Appliances, The, 65

Various Estimates of the Life of the Rand, 64
Village Deep Developments, 65

Wages Bill of South African Mines, The, 88
Wankie Colliery, The, 133
War and the Further East Rand, The, 617
War and the Industry, The, 597
Weight of Rand Stamps, The, 8
Welfare Work on the Main Reef, 472, 491
Welfare Work on the Mines of the Rand, 11
Western and Far Western W.W. Rand, The, 10
What South African Mines Buy, 106
What's wrong with Rand Metallurgical Practice? 400
What is wrong with South African Mining? 5, 33, 276
Wholesale Mining and Milling, 156
World's Three leading Gold Mines, The, 158

Year with the Robinson Deep, The, 448
Year's South African Insolvencies and Company Liquidations, A, 42

STATISTICS.

Banking, Union, 28
Building, 105, 178, 481, 592

Cape Insolvencies, 76
Customs, Southern Rhodesia, 378

Dividends, 443, 469, 489, 561

Export Trade in 1913, 105

German South West African Trade, 660
Grades, Costs and Profits, Jan., 44; Feb., 179; March, 280; April, 416; June, 608

Labour, European, 592
Labour, Native (Rand), 592
Labour, Native, Rhodesian, 40, 168, 521

Mine Mortality, 517
Mine Purchases, 106

Ore Reserves of the Rand, 215

OUTPUTS.

Coal Natal, 22, 580
Coal, Union, 470, 632

Diamonds (S.W. Fields), 558, 655

Gold, Rand, 1914, 398
Gold, Rhodesian, April, 377
Gold, Rhodesia Southern, March, 251
Gold, Transvaal, Jan., 19; Feb., 45; March, 170; April, 311; May, 431; June, 541; July, 598; 607, 619

Mineral, Manicaland, 103
Mineral, Rhodesian, 131, 134, 403, 502, 585
Mineral, S. Rhodesian, 501, 605

Rand Gold Mines in 1913, 38
Railway and Harbour Expenditure, 482
Rhodesia Chamber of Mines, 434, 605

Transfers of Property in 1913, 76
Tobacco Industry, 232

Union Exports, 611
Union Finances, 236
Union Imports, 611
Union, Postal, 437
Union, Trade, 548

Wages, 88, 89

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CONTENTS.

PAGE
Notes and News 1
Topics of the Week:
The "Chapman" Report on Industrial Problems 3
Gold Mining and the Generalization Fallacy ... 3
The Native's Pay and Opportunity on the Mines ... 4
What is Wrong with South African Mining—IV. 5
Natal Mining and Prospecting 6
The Manager and Staff of the Brakpan G.M., Ltd. ... 7
The Weight of Rand Stamps 8
The Messina Company's Twin Shafts 9
The Western and Far Western Witwatersrand 10
Welfare Work on the Mines of the Rand—II. 11
Position and Prospects of the New Heriot 12
Advertising Oil in Madagascar 12
Chamber of Mines' Annual Report 13
The Position of the Transvaal G.M. Estates 14
Proposed New Industrial Legislation 15
Report of the Economic Commission 16
The Cost of South African Commissions 17
Rhodesian Section:
Latest Mining News 18
The January Output 19
E.R.P. Mines Position and Prospects 21
Engineering Notes and News 23
Mining Men and Matters 25
Finance, Commerce and Industries 26
The Week in the Sharemarket 27
Correspondence and Discussion: "Refractory Ores" ... 27

Notes and News.

Dredging on the Revue.

The dredge belonging to the Andrada Mines, Ltd., began working in the Revue River at the beginning of this month, and up to a few days ago the results were eclipsing all expectations. The dredge itself is running excellently and all the machinery working most smoothly.

* * * *

Welfare Work on the Rand.

Elsewhere we print another instalment of the official account of what the United States Steel Corporation does for its men. Its lessons, we trust, will not be lost on the Rand. A large employer of labour in the north was once asked by Sir George Livesey whether a contented worker was not worth 5 per cent. more than a discontented one. "Five per cent.!" was the reply; "say, twenty!" The percentage may be in doubt; but there is no doubt that work of all kinds can be carried on more efficiently if we have contented labour. Labour, too, will be the better for its contentment. The hours of employment will pass more speedily and happily if a merry heart inspires the daily toil.

* * * *

Central African Labour for Natal Planters.

It has always been a moot point whether tropical natives, unfitted for the Rand, might not suit Natal. Thus, at the annual meeting of the Natal Bank, the other day, the Chairman said, in regard to labour for the planters, that although there was a shortage, especially on the South Coast, planters appeared fairly supplied. But, pending a satisfactory solution of the difficulties with the Indians, those engaged in the industry, and particularly the large estates, were naturally anxious. A scheme was, however, being influentially pushed, the object of which was to bring down natives from Central Africa under the same recruiting conditions as obtain on the Rand. Natives from this area were recruited for work on the mines, but the change from a hot climate to a high altitude and underground labour resulted in such a high rate of mortality that humanitarian considerations compelled Government to intervene. It was now proposed to try them on the sugar estates on the coast, and if the experiment was successful it would not only solve the labour difficulty for the planters, but enable freer recruiting locally for the mines.

* * * *

Position at the City Deep.

In January the City Deep mine, despite the strike, milled a greater tonnage than the average monthly amount put through the battery during the preceding quarter, whilst the profit earned per ton was higher. The completion of the new circular shaft will take time, and probably not till early in 1915 will its full benefit be secured. Steadily, however, there has been additional underground cross-cutting and driving, making better ventilation conditions, as connections between the two existing shafts have been effected. The ability of the manager to open up more stoping faces has also been such that it is expected from now onwards that a better supply of ore for mill requirements will be forthcoming.

* * * *

1913 with the Robinson Group.

Annual meetings of the Randfontein and Langlaagte Estates Companies are to be held very shortly, and it will here be of interest to note briefly the results secured by the "Lone Group" of the Rand, as indicated by monthly and quarterly reports and to compare these with the 1912 results. The Robinson group as a whole shows some advance. The Randfontein Central's working profit has risen from £886,000 to £921,000, the ore treated being of slightly higher grade, with the result that the profit per ton works out at 7s. 3d. as against 6s. 11d. At one time during the year it promised to make even a better showing, but during the second half of the year profits fell off owing to the labour position curtailing the output, the average number of stamps run during the last quarter being 825, as

2

compared with an average for the two preceding quarters of about 865. When the greatest number of stamps were running the company's working profits were at the rate of practically £1,000,000 per annum. The Langlaagte Estate has not done so well, owing to a decline in tonnage and grade. The revenue was £691,232, as compared with £730,822 in 1912, and the profit at £160,650 was about £13,000 lower.

* * * *

The Ethics of "Sacking."

Claudius Clear once wrote an interesting essay on the ethics of "Sacking," capable of easy application to the mines of the Rand to-day. It bore the suggestive caption: "Firing out the Fools, and Taking Good Men into Confidence," and incidentally it went to show that in America the mark of efficiency in the employer or overseer is a short way with incompetents. Indeed, not the least of the many striking object-lessons in successful American methods afforded by the organization of the Panama Canal work under Colonel Goethals was the latitude allowed to the foremen of works—equivalent to the shift-boss on our mines—in the matter of dismissing men. The motto of the builder of the canal was "Trust the man on the spot," and except in cases where there were allegations of bribery against the foreman as the motive for changing his men, Colonel Goethals invariably refused to review the decisions of his tried and trusted lieutenants. Obviously, this again raises the whole question of dismissing men, about which such a rumpus has been made on the Rand. Should we, as the practice and tendency has lately been, go on multiplying miniature courts of review for dismissed men, giving them, first, grievance boards, then access to managers and even, finally, appeal to directors; or should we put more trust in the "man on the spot"—the shift boss or mine captain, as the case may be, whose position is obviously liable to be made impossible by the decisions of a superior authority. Plainly the subject merits further discussion, and the last word has yet to be said in regard to it. In this connection the following extract from a letter dated January 14th last, from Col. Goethals to the Mayor of New York, is noteworthy. The Mayor had offered Colonel Goethals the post of Police Commissioner of New York. Colonel Goethals, in his letter, stated that he was disposed to accept, provided certain conditions could be complied with, of which the most important was that he should be given absolute power to dismiss subordinates found at fault. This is what Colonel Goethals writes on the point:

> "Assuming that I will be allowed to remain here until the Canal is completed, and that on application I will be placed on the retired list, attractive as your offer is, I would be obliged to decline it so long as the present law remains in force by which removals from the police force are subject to review by the Courts. In public work of any kind efficiency can be secured only when the service of those engaged in it is satisfactory to superiors, and while I fully believe in the right of every man to have a hearing, the decision of the superior as to the character of the man's service should be final. In cases where a man whose services have not been satisfactory can be reinstated by a Court of Review, the effect on discipline and efficiency is most injurious. It undermines authority, leads to insubordination, tends to destroy the loyal co-operation which the executive authority must have to secure results, and makes his tenure of office impossible. Assuming, therefore, that I were free to choose after the completion of the Canal, I would gladly accept your offer, provided a change in the law is secured which would vest the right of removal in case of unsatisfactory service in the hands of the Commissioner."

Whether the effect of these courts of review on the Rand is so injurious to discipline and efficiency as Col. Goethals fears is a point upon which a volume of direct local evidence should soon be available. Until it is forthcoming it might be wise to suspend judgment on the question.

* * * *

Mr. Evans on Technical Education.

On Thursday night, in presiding at the presentation of prizes to evening class students at the School of Mines, Mr. Samuel Evans made an important pronouncement on the value of technical training to the white youth of South Africa. *Inter alia*, Mr. Evans said:—A very careful report has recently been prepared by Mr. John Robinson for the Witwatersrand Council of Education. From that report I gather that last year rather more than 1,000 boys, mostly under 15 years of age, and who had barely passed the fifth standard, left the schools on the Rand to seek employment, and it is to be feared that more than half of them went into blind-alley occupations. I think we must admit that that is a deplorable state of affairs in a country where the unskilled labourer has to compete with the Kafir. In that connection, I shall venture to quote to you a paragraph from the report of the Economic Commission, which has just been published. The Commissioners write:—

> Finally, your Commissioners conclude that in initiative, resource, and powers of control the white races unquestionably stand pre-eminent. It is important that the rising generation of the whites should fit themselves to fill supervisory and highly-skilled positions, so that such competition as may be felt in the future may force them upwards rather than downwards. The State and local authorities can assist the movement in the right direction by providing educational facilities. With reference to industrial needs, success cannot be achieved by the white man in South Africa by keeping the coloured man down, but by his raising himself up.

"I hope," said Mr. Evans, "the conditions I have mentioned, and the words I have quoted, will be taken seriously to heart by the white inhabitants of the Rand and by the Government."

* * * *

Mining as a Career for South Africans.

It is, unfortunately, not possible to give the space they deserve to the important points in the speech made by Mr. Samuel Evans at the School of Mines on Thursday evening. His remarks on the opportunities afforded by Rand mining to young South Africans may be quoted:—"All the positions worth having on the mines to-day require the solid foundation of a thorough primary and general education, and a great deal of technical education," said Mr. Evans. "It is hardly necessary for me to point out that the opportunities here for learning practical mining are unsurpassed, and we ought to be educating mine managers for all the gold mines of the world. I have heard it said that the fear of miners' phthisis has caused some students, at any rate, to hold back. I believe that it cannot be too widely known that what has been done in recent years should dispel the fear I have referred to. Let me quote what Dr. Watkins-Pitchford said at Capetown at the beginning of last month: 'It is no mere euphemism to say that a scrupulous obedience to the spirit of the present mining regulations will result in the total abolition of pulmonary silicosis from the gold fields of the Rand.' I may mention that General Gorgas told me that in his opinion if the men underground carried out the provisions of the existing regulations, and persons suffering from tuberculosis were kept out of the mines, there would be little to fear from miners' phthisis on the Rand. I believe I am right in saying that most medical men agree with General Gorgas and Dr. Watkins-Pitchford. It has been suggested to me that the recent statement on the life of the Rand submitted to the Economic Commission may have a tendency to diminish the number of mining students. I am afraid that the somewhat doleful comments have given rise to fears which are really not warranted by the statement itself." It is clear from this that one result of the Gorgas report will be the exclusion from the mines of those infected with tuberculosis—certainly not a moment too soon!

* * * *

Rhodesian Records.

For the first time in its modern history Southern Rhodesia produced minerals having a total value of over three millions sterling last year. It is assured that this year will witness further large augmentation of the country's revenue from mineralised areas. The effect of production from the new and large mines which have recently entered the revenue earning stage will be to augment the present rate of gold output, which is 58,000 ozs. per month by about 50 per cent. Before the end of 1914 a fresh record should be established by the declaration of an output of about 85,000 ozs. per month, or, say, approximately one million ozs. per annum. The Shamva is expected to contribute about 12,000 ozs. per month and the Cam and Motor 7,500 ozs., whilst the Falcon, Bell, and Antelope should between them yield another 6,000 or 7,000 ozs.

TOPICS OF THE WEEK.

THE "CHAPMAN REPORT" ON OUR INDUSTRIAL PROBLEMS.

Socialists in England are wont to describe Professor Chapman as the "woodenest of present-day exponents of the Dismal Science," but the character is belied if we rightly trace to him the human note that pervades the report of the Economic Commission. If to err is human, the report, it may be said at once, leans to the latter, in that it is not perfect; indeed, its ambitious attempt to tackle so many burning industrial questions of the moment precludes any claim to wholesale infallibility. Still it must be admitted that the report is a contribution of the very first importance to the economics of industry in South Africa. Its clear and logical handling of the colour question alone would merit for it that distinction. To the views expressed on that very pressing problem of the hour we devote a separate article, and the summary of the report is likewise presented elsewhere in this issue. But no summary does justice to to the report itself, which never fails to set out a plausible case for its conclusions even where they seem least convincing. Eight sections, with the addition of a number of appendices are comprised in the report. Briefly, section 1 deals with the cost of living; section 2, with wages and conditions of white labour; section 3, with the wages and conditions of non-white labour; section 4, with the question of legal minimum wages and allied matters; section 5, with the voluntary system of arranging wages and conditions of labour and machinery for settling disputes; section 6, systems of paying wages; section 7, hours of labour and payment for overtime; section 8, summary of conclusions. Criticism is first provoked by the obvious impossibility of dealing with such a number of inter-related questions in air-tight compartments, with the attendant danger of overlooking the fact that a question, such as that of colour, qualifies and conditions almost every other in the category. Many of the recommendations of the Commisioners are of a non-contentious nature, and here the practical hand of a Chairman familiar with the lines which social evolution follows in older countries is manifest. No one is likely to quarrel with those portions of the Commission's recommendations which advise periodical inquiries into the cost of living in the different parts of the Union, the establishment of a non-political Advisory Council to deal with native questions, the appointment of an Industrial Commissioner to administer legislation relating to trade unions and industrial disputes, and to deal with the problem of low wages, the voluntary registration of trade unions, and the protection of non-unionists. In the same category are the recommendations of a Factory Act, the comprehensive regulation of shop hours, a legislative enactment of one day's rest in seven, periodical industrial reports, and the centralisation of the administration of all industrial and mining legislation. We are not surprised to find that the Commission endorses the generally accepted view that the Rand miner is the best paid workman in the world, and indicates that the evil of miners' phthisis, which may be taken to justify the high rate of wages, is successfully being eradicated. The Commission is on fairly safe ground in recommending the abolition of the contract system in favour of day's pay *cum* bonus; and the pious hopes in regard to an eight hours' day "bank to bank" and overtime pay are advanced with no great show of emphasis or conviction. As we anticipated when the terms of reference were announced, the suggestions of a minimum or "subsistence" wage for this country and wages boards are scouted, and scant ceremony is wasted in dismissing them. In regard to cost of living, the Commission has done the Rand a disservice by ignoring the unique opportunity to ventilate our manifold grievances under the head of railway rates and Customs duties. Particularly in regard to the former a volume of evidence was submitted to the Commission that left no doubt whatever where to place most of the blame for high rents, with their corollary high cost of living. The Commission, however, refuses to endorse these views; and recourse is had, in explaining the phenomenon of cost of living, to some unconvincing generalisations and discursive remarks on the "two distinct social strata" into which the South African population is divided. Chiefly on the question of trades unions, however, the Commission is disappointing and lays itself open to really serious criticism. This section of the report might have been written by Sir George Askwith for the delectation of any modern Labour-ridden community in England or Australia. We deny that South Africa today falls in that category, and all the counsels of perfection, therefore, that mark and adorn this portion of the report have not the remotest bearing on the case. For a brief moment, the Commissioners seem to have fallen into the common pitfall that awaits those who attempt to apply wholesale to the Rand and South Africa the lessons learned in older industrial communities. They forget the native factor; and the colour problem, that elsewhere in the report is excellently handled, is here temporarily overlooked altogether. When all excuses are made for them—and it is a very forcible and eloquent plea indeed that the Commission puts up—the much-abused agitator and greatly misunderstood Federation of Trades are still particularly undesirable in this country. They are a transplanted, exotic growth—they have been even called a fungus—and South Africa, with all its complexities of colour, mixtures of races and clashings of many civilisations, is the last place in the world that ought to extend them a welcome, though Professor Chapman and his colleagues—good, easy men!—charm us never so wisely. Frankly, this portion of an otherwise informative report leaves us cold and unconvinced. For the life of us we cannot see the *raison d'etre* of the agitator; nor the validity of the description of the Federation of Trades as "the second line of defence" against strikes, nor even, the vital necessity for any enthusiastic recognition of trades unions. On these questions we reluctantly part company with Professor Chapman and his fellow-Commissioners. In other respects the report, as we have already tried to indicate, is a valuable contribution to the sparse literature of South African economics.

GOLD MINING AND THE GENERALIZATION FALLACY.

"Generalization," says an elliptical literary authority, "is genius"; and the aphorism is doubtless true in the sense that nothing short of positive genius can prevent people given to glib generalization from committing many egregious blunders. The application of the foregoing is seen in the airy way in which some of the leaders of local tin-pot industries—excellent fellows, doubtless, in their way—insist on lecturing the mining industry as to how it should solve its special problems, such as dealing with organized labour and "keeping the native in his place." For instance, our worthy master-builders, find that owing to circumstances peculiar to their trade, it pays them to work with and foster their employees' trade union; and further, that they can easily afford a fancy price for all white labour by the simple expedient of passing the cost on to the would-be house owner. Nobody, of course, would blame them for that. But when they start to generalize from the conditions governing their own particular industry that it will pay all other industries, notably, of course, the gold mines—always fair game for the gratuitous advice scatterer—the crass impertinence of the thing becomes patent. Compare, say, the wages question in different industries. In considering this question on the mines it must be constantly borne in mind that the price of gold cannot be modified either up or down, and that any increase or decrease in the pay of the men falls on or benefits shareholders and not the consumers of gold. To a large extent this is also the position of South African farmers. For instance, the price of maize, wool, hides, bark, ostrich feathers, etc., in South Africa is governed almost entirely by the price which these products will fetch in the markets of Europe, and the farmer cannot add to the price any increase that he may have to make in his wages bill. The building trade is different. A master builder said the other day: "The mining companies ought to do what we have done: recognise the unions, and, in fact, encourage the men to join the unions. We have done this, and we have no trouble with our men. In fact, we are a lot better off now than we were before." The fallacy in this reasoning is: once all the men in the building trades are in the unions they and the masters can compel the public to pay their price for practically all the building work that has to be done. That is, any increase in the wages of the worker does not fall on the master builders at all, but on the public who happen to be building houses. In fact, the two parties between them conspire to create a monopoly and rob the public. This point is put very clearly in a judgment given by Mr. Justice Heydon, of Sydney, in the case of the gas companies of that city and their employees. The companies were willing to increase the men's pay, provided they were allowed to raise the price for gas. The judge said:—

> "In the face of Section 20 of the Act, it is clear that in applications by the union for higher wages, the union stands face to face, not with the gas companies—but with the purchasers of gas. The mask is off and without disguise the question plainly is—Shall the gas rate be raised, that the gas wage may be raised? I do not say this as suggesting for a single moment that the gas rate should be one farthing lower than is necessary to pay full and fair wages, but it is a strong reason against the giving of what I term monopoly wages—that is, excessive wages practically agreed to by employers in industries in which the increase can securely and without fear of competition be passed on to the public. I have no doubt whatever that many of the increases awarded since arbitration courts and boards came into existence have been arrived at because the matter had ceased to be of vital importance to the employers, and that the real party interested—that is, the public—was without representation on the tribunal, except in the person of the Chairman, who can do nothing when the members agree—and without an advocate before the tribunal.
>
> "Something was also said on the vexed question of whether increases of wages increased the cost of living. Here we catch the process in the very act, as it were, and can examine it at leisure. If a wages board were to give the men this shilling a day extra all round, which they ask—and to which as a matter of fairness they may, in fact, apart from their agreement, be entitled—at once the amount would be provided by the gas buyers. The householder would have larger gas bills, and the penny-in-the-slot people would get less for their penny. Evidence would be given before wages boards of the alarming increase in the cost of gas. Increases in wages, unless the workers earn them by the increased productiveness of their labour, must come out of somebody's pocket. The same consequence follows in all cases in which the increase can be passed on, but it is not always seen quite so plainly."

Recently, the Union Government offered to refer the bulk of the demands of the miners and other workers to a Commission of Enquiry composed of one representative of the miners, one of other working men, one of the mining industry, and one of other employers, with a Chairman nominated by the Government, five members in all. Naturally, this was not satisfactory from the point of view of the mining industry. The objection to the composition of the Commission was that the real interests of three out of the five members might be on the side of the Trades Hall. It was obvious that if a master builder were nominated as one representative of the employers it would be to his interest to accede to the demands of the men rather than have them hostile, as the employers he represented would be able to pass on any additional expense involved in the granting of the demands of the men to the public. It was pointed out that no Commission investigating wages on the mines would be satisfactory unless the companies and the mine workers had the right to appoint two each out of the five members. As a fact, to arrive at satisfactory results, the mining industry must be treated by itself and not mixed up with other industries, particularly industries in which any addition to the wages bill or any reduction in the hours of work really affect the public and not the employers. Moreover, in the light of this, we can discount the trumpetings of the Building Trades Federation in regard to the much-vaunted maintenance of a white labour policy and their co-operation with the operative unions. However effective these nostrums may be in the building trade, it is simply no use prescribing them for the ills of the mining industry, for the simple reason that the latter is different—that is all.

THE NATIVE'S PAY AND OPPORTUNITY ON THE MINES.

The case against the colour bar on the mines of the Rand, presented in our last issue, has aroused extraordinary interest. This was intensified by the publication during the week of the Economic Commission Report, confirming our anticipations, clenching our arguments, and affording the amplest independent testimony to the justice of our conclusions. Public opinion, it may now safely be said, is awake to the importance of the issues involved. Here we have a Commission, headed by an English Professor of Economics, bringing to our problems a fresh outlook and a mind, if anything, biassed against the very suspicion of the exploitation of coloured labour by European capital, declaring in the plainest possible terms that the colour bar must go. Like the Chairman, the other members of the Commission are demonstrably less inclined to take the mere employer's view than otherwise; yet all plump for reform on the colour question, and no dissentient voice mars the unanimity of the decision. As we point out elsewhere, the Commissioners are all for denying to organized labour no advantage that organized capital can be said to enjoy, and their whole conception of the trend of present-day social evolution—to use their own expression—in this country is based upon the very latest manifestations of that movement in Europe. It is, of course, entirely in keeping with this attitude of mind that the Commissioners recommend the fullest industrial freedom for the native on the mines. The acceptance in its entirety of this policy, it seems to us, is shown to be founded on what the Labour papers call "the divine right of justice," and for our part we believe that the reform will bless both givers and recipients and be attended by enormous benefits all round. Plainly the Commissioners are far from satisfied with the present treatment of the natives, both in point of pay and status. Take this illuminating passage from the report:—

> Your Commissioners feel no doubt that the productive powers of the native are being held in check while at the same time a sense of injury is being generated by the device of the maximum average in particular, and in general by a failure on the part of the gold mines to pay natives more frequently on a system which furnishes an incentive. To the system of piece rates for white workers there may not infrequently be objections, but these objections do not carry the same weight in the case of the native. He is in that stage of industrial development in which the crude incentive of gain is an important, if not an indispensable, educational instrument.

And again, apropos of the native dissatisfaction, Mr. Taberer told the Commission:—

> There is only one suggestion to make, and that is to recognise the native as a worker and pay him wherever possible according to his capacity . . . . they have had a very excellent example of how easy it is to defy the law and order, and that has pushed their minds ten or fifteen years ahead in the knowledge of how to get the things they want. . . . I think the mine natives on day's pay do not, naturally, over-exert themselves, provided they do sufficient to justify its being marked on their tickets. That is about all you may get out of them. If you pay them according to their capacity, I think you will get very much better work out of them, and therefore you will be able to do with fewer natives.

Their final conclusion on the question as summarised by the Commissioners is clear-cut and decisive: "It is undesirable," they say, "that barriers should be placed in the way of non-white labourers by the State or local authorities to prevent the advancement to any kind of work of which they are capable." The weight and value of this candid opinion, it seems to us, can hardly be over-estimated. How Parliament and the Mines Department, and the T.M.A. will receive it remains to be seen. The first-named, we venture to predict, cannot for long continue to ignore the glaring injustice perpetrated by sectional legislation in the name of white labour, now so patently brought home to it; the second can hardly find a more fitting opportunity or clearer right for freeing itself from the, doubtless, galling fetters of Trades Hall domination; and the last-named, at any rate, can lay the flattering unction to its soul that, by its actions and those of the precious Federation of Trades, the light has now been rudely let in on the real crux of the labour situation on the Rand.

What is Wrong with South African Mining?---IV.

Parliament Interested—Questions in the House—Commission May Be Appointed—More Representative Views—A Rhodesian Opinion—Prospectors' Shortcomings—Chamber of Commerce President Favours Government Enquiry.

In view of the numerous fears regarding the decline of mining on the Rand expressed in several influential quarters of late, and, further, of the growing popular belief that mining in South Africa is rapidly deteriorating, and prospecting losing its attractions, we have invited for publication the views of leading engineers and mining men on the following questions:—In Regard to the Rand: (a) *Do you think it would pay the Government to prolong the life of the fields by reducing indirect taxation?* (b) *Should the Government help the industry by direct financial assistance or scientific research work in the form of the Mines' Trials Committee or some similar body?* (c) *By using its influence in the sphere of unskilled labour, can the Government do anything to prolong the life of the industry?* (d) *Can you suggest any other way by which the Government can help to attract capital, open up dormant mining areas and so to prolong the life of the industry?* (e) *Do you forsee any opening for further reduction in working costs, and if so, in what direction? In Regard to the Rest of the Union and New Discoveries:* (a) *Do you consider the Government should encourage prospectors and "small men" by:* (1) *Reducing or abolishing claim licences?* (2) *Throwing open all farms to prospectors, with due safeguards?* (3) *Foregoing transfer fees?* (4) *Direct financial assistance?* (5) *Waiving mining regulations?* (6) *Or in any other way? And, generally, would you favour a Government Commission to enquire into the foregoing?*

The subject of this enquiry has now attracted the attention of the Union Assembly, and the Minister of Mines has promised to make a statement in regard to it in the House next Tuesday. During the week Mr. Nathan, Member for Von Brandis gave notice to ask the Minister of Mines on Tuesday next whether attention had been drawn to certain articles, entitled "What is Wrong with South African Mining?" in the *South African Mining Journal*. With a view to prolonging the life of existing mines, was the Government prepared to give financial assistance, institute scientific research work, and use it influence with regard to unskilled labour in order to lower working costs and the opening up of new mining areas? Did the Government see any opening for further reductions in working costs, and in what direction? Further, in his question, Mr. Nathan will ask whether the Government will appoint a Commission to consider the question generally as to the best plans to be adopted to develop and extend the mining industry in the Union. The importance of the issues thus raised cannot, of course, be exaggerated, and it is earnestly to be hoped that the Government will decide to institute the desired enquiry into the many phases of this wide-reaching subject. It is not too much to say that every other aspect of South African mining has been made the object of enquiry by Government Commissions except this—the most important of all. Almost every side of the labour question, health conditions, and the internal economy of the industry has been examined and reported upon *ad nauseam*, yet this, the question of supreme interest for the country, has never had the advantage of the searching investigation it so obviously calls for and deserves. To our mind, recent events have forced into a prominence that cannot now be ignored the whole question of the future of mining in this country, resolving itself into the twin *desiderata*: (1) How to prolong the life of the Rand, and (2) how to exploit the vast mining potentialities of the "outside districts." Meanwhile, in awaiting the decision of the Government, a few more representative views on the subject may be quoted.

The Prospectors' Shortcomings.

A well-known consulting engineer to one of the large companies owning many properties in the outside districts writes: "I am naturally only competent to speak of the outside districts, *i.e.*, in regard to the second part of your interrogations. It seems to me that the real reason why prospecting languishes in the Transvaal is because of the failings of the average prospector. He has little knowledge to guide him and many vices to handicap him. Of the rudiments of geology necessary to his success he is usually woefully ignorant. But the whereabouts of every country bar and bottle store is mapped indelibly in his brain. He is often a slacker, occasionally a romancer about his past successes, and almost invariably suffers from the prevailing countryside weaknesses of prevarication and procrastination. Prospecting, it must never be forgotten, is a scientific undertaking that requires initiative, resource and perseverance, and until the type of man available vastly improves in character and knowledge of his work, prospecting in this country must continue to languish."

A Rhodesian's Downright Views.

A Rhodesian consulting engineer writes: "To take the latter part of your queries first, I can only say that had this territory (Rhodesia) to submit to the mining law and regulations such as you 'enjoy' in the Transvaal, quite seventy-five per cent. of the small mines here would have to close down. The cumbersome and clumsy red-tape regulations and the enterprise-stifling laws under which the Transvaal groans are a disgrace to any so-called progressive State. I say it advisedly and with due recognition of the seriousness of the matter, that no greater bar to the possible amalgamation of the Union and Rhodesia exists than this dissimilarity of mining laws. The Rhodesian mineowner and small owner, when he studies the subject at all, is astounded and terrified at the restrictive and discouraging character of your legislation, and if General Botha still cherishes the hope of one day absorbing this territory in the Union, he can find no more effective means nearer his hand to further his object than the reform of the mining laws and regulations of the Union. To quote only one example: Rhodesian mining labours under no such silly restriction as your 'colour bar.' To appreciate what our native labour untrammeled by such mediaeval conditions means to us in Rhodesia a visit to our mines is necessary. I can only say that it would prove a veritable eye-opener to some mining men down south."

Another Mining Man's Contribution.

"A Mining Man" writes: "Undoubtedly your journal has done a valuable service to the whole community by drawing attention to the present unsatisfactory condition of mining in South Africa. I am glad to see that attention has been directed in the House of Assembly to the articles appearing in the *South African Mining Journal*. This is only right, for the prosperity of the country depends on the mining industry, and I hope our legislators will take the matter up seriously. You ask me what can be done to increase the prosperity of mining in South Africa, and how activities may best be extended. It is my opinion that efforts may be much better expended in prospecting for new fields and re-opening abandoned areas than in any other directions. The Rand is, of course, susceptible of great improvement, particularly in regard to the lowering of operating costs and the working of the vast low-grade areas of the Main Reef series at a profit. We are all cognisant of this, and from Randfontein to Springs all energies are to-day concentrated on bringing down the cost of production. It is good policy to keep 'rubbing it in' to the Government that upon success along these lines the future prosperity of the Rand depends. But whilst I see very large scope for expansion of mining in this way I believe that there is an even greater field for the extension of mining in South Africa in developing the outlying districts, in giving mines that were closed down under the adverse conditions that existed a few years ago further trial and particularly in the direction of locating extensions of the Main Reef series. The Coronation Syndicate fiasco, and the lack of success attending boring operations on the Further West and South-West Witwatersrand dealt a fatal blow to prospecting enterprise in these areas. I still maintain, however, that there are extensions of the auriferous belt, of which Johannesburg is the centre, to be located to the south-east of the present *ultima thule* of Rand mining operations, that is to say, in the country lying between Daggafontein and the Nigel. I believe, too, that an undiscovered gold field lies somewhere between the southern extremity of Randfontein and Potchefstroom. These reefs are overlain by hundreds of feet of younger formation and diamond drilling there is an expensive matter. The Government should offer inducements to mining companies to re-prospect these areas. I have not given the subject sufficient thought to say in what manner inducements might best be offered, but perhaps something in the nature of a bounty might be offered for so many feet drilled, and it might further conduce towards activity if relaxations in regard to profits tax and other State impositions were offered to companies that, after bearing the heat and burden of drilling through a substantial thickness of overlying strata located payable mines. Diamond drilling through deep belts of dolomite and diabase is a costly affair, and the burdens must be lightened. There are reefs in the areas I have named which would pay for working; I do not say they can be correlated with the Main Reef series, but they are there all the same, and what is more some of them contain gold in payable quantities."

A Pretoria Opinion.

Opportunely enough, Mr. H. R. Abercrombie, the President of the Pretoria Chamber of Commerce, dealt with the subject of our enquiry very forcibly in his address to the Chamber this week. *Inter alia*, he said:—" I think that a much too pessimistic note has been sounded with regard to the future of the gold industry. In the first instance, every year we improve our mining methods. The improvement in stoping machines and the more economical use of the native labour supply will tend towards a considerable reduction in working costs. At the end of five years it will probably be found that a great deal of the Main Reef can be put through the mills at a profit. At the same time, it is important that the Government should take some means to investigate the life of the gold mines, and in addition, by prospecting and drilling, to ascertain what new fields are likely to exist. The Lydenburg district seems to me to be one particularly favourable to this investigation. We have no idea as to the extent of the reefs in the dolomite series. This can be proved in many instances by drilling, as the reef has a very shallow dip. The dolomites cover an immense area in the Transvaal, and have never been fully explored. I feel sure that a full investigation of this series will prove that the gold mines of South Africa will be worked on a very large scale for considerably over a century."

NATAL MINING AND PROSPECTING.

Summary of Activity in Several Directions.

From the annual reports of the Magistrates for the several districts of Natal, we take the following:—In the Alexandra district prospecting for gold had been carried on at intervals for many years and reefs had been discovered giving samples rich in the metal, but in every instance they had proved failures owing to the patchy nature of the quartz or through the reef entirely disappearing a few feet from the surface. Recently a small syndicate opened up one of the old workings, known as the " Happy Thought," and succeeded in again striking the reef carrying gold over 1 oz. to the ton. It afforded employment to several Europeans and a number of natives and whether it would prove a payable proposition the year 1913 would show. In Newcastle two coal mines previously closed down had re-opened so that there were now seven in operation. In Durban prospecting for gold had taken place in the quartz or quartzite formation on the farm Springfield near the borough boundary. Traces of gold had been obtained. In the Alfred district rather promising specimens of gold quartz had been found in the lower portion of the district and a number of claims pegged out. Nickel, copper and graphite deposits had been found at the Ingeli, but it was doubtful whether they were of any commercial value. In Helpmakaar in the latter part of the year steps were taken to exploit asbestos in the native location reserve and at the same time a movement was initiated to work the ingredients of red ochre. Both Inanda district and Kranskop were reported to be rich in minerals, but no operations had taken place during the year. In Klip River three coal mines were in operation, employing 57 Europeans, 1,015 Indians and 484 natives. In Nqutu gold, copper and coal were reported to exist, but had not yet been found in payable quantities. In Ngotshe prospecting for gold had been going on for many years and several finds had been made, but not rich enough to warrant spending capital on development. The Wonder gold mine had closed down. A battery had, however, been brought to another property with a view to crushing. In Paulpietersburg coal of an excellent quality was found in several parts. The deposit at Makateeskop was especially large and rich. The completion of the railway was expected to give an impetus to coal mining. The Dumbe mountain coal was being leased out. So far prospecting only had been done on the gold reefs, which traverse the eastern part of the district. In Port Shepstone marble occurred in large quantities on the banks of the Umzimkulu and Umzimkulwana rivers, but was only used for the production of lime and fertiliser. In Utrecht a few coal options had been acquired by syndicates and new mines might spring into existence at any time. The collieries in existence employed 32 Europeans and 801 natives. The Magistrate was of opinion that if Government expropriated the railway from Newcastle to Utrecht an impetus would be given to mining. In Vryheid gold was still being prospected for in the Golden Valley about 12 miles from the town. The Hlobane Rail and Coal and Iron Colliery employed 36 Europeans and 653 natives and put out nearly a quarter of a million tons of coal. The South African (Vryheid) Coke Company produced 3,000 tons of coke and employed four Europeans and 50 natives. In Eshowe prospecting and mining were carried on by the Sitilo, Dolly Boy, Rebellion and Havilah companies and syndicates. All except the first gave their attention to gold, the first developed for asbestos. They were in most cases still prospecting and developing. In Empangeni there was one long-abandoned coal mine only. In Emtonjaneni prospecting for gold continued all over the district. A schist formation gold mine started crushing in April or May, but stopped again temporarily in November. In Nkandhla asbestos of very short fibre occurred and gold prospecting with reports of good finds was commented on. In Ndwandwe prospecting for coal and copper, both of which occurred in the district, was carried on at odd times.

The S.A. Anti-Malarial Association.

An excellent article appeared in the February number of the Union Agricultural Journal on " Mosquitoes and Malaria," written by Mr. Faure, of the staff of the Division of Entomology, Agricultural Department, at the suggestion, and with the aid, of the South African Anti-Malarial Association.

THE MANAGER AND STAFF OF THE BRAKPAN GOLD MINES, LTD.

5th row :—S. A. Fleming (Native Assist. Timekeeper), J. Schaap (Asst. Surveyor), J. Rowe (Asst. Sampler), L. Frost (Red. Office Clerk), G. Hobden (Asst. Assayer), J. H. Taylor (Telephone Operator), J. Rogers (Shaft Clerk).

4th row :—W. Pryce (Chief Assayer), J. Russell (Hospital Attendant), J. Coetzee Asst. Native Timekeeper), H. Bird (Head Sampler), W. R. Crous (Asst. Timekeeper), G. Brinton (Asst. Surveyor), C. J. Bedborough (Draughtsman), A. Harvey (Foreman Mason), J. Marshall (Foreman Carpenter), E. J. Lawlor (Asst. Compound), J. Ridgard (Asst. Compound), J. T. Rive (Asst. Storekeeper), H. E. Maner (Asst. Compound).

3rd row :—W. J. Pullin (Asst. Foreman, Recovery House), J. Gemmell (Asst. Hospital Attendant), A. Scott (Hospital Attendant), A. Archibald (Shift Boss), E. Broom (Paymaster), R. S. Terry (Asst. Cyanide Foreman), M. Halliday (Foreman Timberman), W. S. Ferris (Shift Boss), V. van Kochowsky (Shift Boss), J. Gourlay (Shift Boss), A. Findlay (Foreman Electrician), —. Keay (Asst. Assayer), W. Robson (Foreman Boilermaker), A. Kinnaird (Foreman Fitter).

2nd row :—A. E. Irwin (Cyanide Manager), J. L. Willey (Recovery House Foreman), G. C. Ormsby (Asst. Native Timekeeper), F. Harris (Asst. Assayer), G. J. Grung (Native Timekeeper), P. Penaluna (Shift Boss), W. W. Madore (Shift Boss), R. Wilson (Shift Boss), J. Miller (Asst. Secretary), D. Corlett (Foreman Smith), W. Morrison (Mine Captain), W. B. Lethbridge (Mine Captain), Hu. Ormsby (Asst. Storekeeper), O. J. Vice (Asst. Compound).

1st row :—M. J. Turner (Chief Surveyor), C. W. Dowsett (Red. Officer), S. Taylor (Underground Engineer), Dr. Kerr Muir (Medical Officer), H. W. Pridgeon (Underground Manager), C. R. Davis (General Manager), M. Schiel (Secretary), W. B. Paterson (Mine Engineer), S. E. T. Ewing (Electrical Engineer), V. F. Harrison (Compound Manager), J. E. Lapping (Chief Storekeeper), A. Armstrong (Chief Timekeeper). J. Reid and J. McAdam (Ticket Sorters). V. Simon and P. Baam (Ticket Sorters).

(R. Olliver, Photo, 98, Pritchard Street.)

THE WEIGHT OF RAND STAMPS.

Investigation of an Important Aspect of Main Reef Metallurgy Revived—Possible Influence of Sunday Observance Legislation—How Weights of Rand and U.S.A. Stamps Compare—Some Remarkable "Duties."

South Africa leads the world to-day in stamp milling practice. Here there are employed the heaviest gravity heads erected, and, excepting pneumatic and steam stamps, such as are, for instance, employed at the Dolcoath Tin Mine in Cornwall, and the copper mines of the Lake Superior region, the duty per head is the largest of any mining field in the world. Last year the duty per stamp per day along the Main Reef Series was 8.82 tons, as against 8.39 tons in 1912, 7.88 tons in 1911, 7.19 tons in 1910, 6.79 tons in 1909, and 6.27 tons in 1908.

The 1914 Duty Anticipated to be Nine Tons.

This rate of increase in tonnage milled per stamp in 24 hours is likely to be maintained this year, and it is anticipated that the duty for 1914 will work out at nine tons or over. Towards the end of this year the "State Mines" 50,000 tons per month equipment on the Modderfontein Government Areas will be completed, and at a somewhat later date the Modder Deep Levels reduction plant, which will consist of 60 stamps and 6 tube mills, and which will crush 30,000 tons per month, will come into operation. It is probable, too, that the Sub-Nigel will extend its crushing equipment in the near future. This mine is outside the Witwatersrand area, but as it comes under the control of one of the most progressive metallurgical administrations in the world, the subject of a possible extension to the Sub-Nigel mill certainly falls within the scope of this article. In the case of each of the mines mentioned in the foregoing, the stamps will be of "heavy pattern." The Rand's stamp duty has been increased, not alone by the use of coarse screening and the employment of tube mills, as auxiliary fine grinding machines, but by greatly increasing the falling weights of the stamps, that is by adding to the weights of stems, heads, tappets and shoes. Just to what degree extra falling weight has been responsible for the increase in duty, and to what extent coarse crushing in the mortar boxes and subsequent fine grinding in tubes have played their respective parts it is difficult to say; the subject is worthy of inquiry.

Investigation Renewed.

We understand that this aspect of Rand metallurgy is now receiving expert consideration by the technical head of the metallurgical department of one of the leading mining corporations, and that, moreover, the whole subject of stamp weights, efficiencies and costs is being investigated most carefully. There has been something of a lull in the storm of technical ambition (initiated some time ago) in regard to the weights of stamps during the past year or two. No very ambitious and new milling projects have indeed been announced since the erection of the new mills of the Consolidated Langlaagte and Van Ryn Deep, under Barnato control, and the attainment of a duty of about 20 tons at these batteries, and also in the new mills of the Roodepoort United Main Reef and West Rand Consolidated. These have stood as the last words in milling achievement on these fields for some time. It will, therefore, be most interesting and instructive to await the result of the investigations alluded to in the foregoing, which will, no doubt, find embodiment in one at least of the new mills or extensions mentioned above.

The Sunday Question.

To what extent deliberations in regard to the future weights of Rand stamps may be influenced by legislation that may result from the findings of the Sunday Observance Commission, it would be premature at this juncture to attempt to say. But it is here worthy of remark that the highest duties obtained on the Rand to-day are recorded by the Consolidated Langlaagte and Van Ryn Deep mills, two batteries which come under the ban of the Sabbath law. Further legislation along the lines of this statute would doubtless influence technical advisers to recommend increased duty so that the milling days lost might not have an accompanying loss in tonnage.

Weights To-day and in 1895.

In the middle nineties the duty of five tons per day was considered exceedingly good, and if we recollect rightly, the heaviest heads on the Witwatersrand at that time were the 40 stamps of the New Modderfontein, each of which had a falling weight of 1,250 lbs. Compare these figures with those for the leading heavy-weight batteries on the Rand to-day:—

	Weight of Stamps. lbs.	No. of Stamps employed. Jan. 1914.	No. of Tube Mills employed. Jan. 1914.	Duty per Stamp per Day. 1914.
Brakpan Mines	2,000	140	8	13.89
City Deep	2,000	150	8	10.8
Consolidated Langlaagte .	1,900	70	7	22.83
Geduld Proprietary	1,650[1]	60	5	12.72
Modder B.	1,650	80	5	13.42
Robinson Deep...	—	105	8	15.48
Roodepoort U.M.R.	1,900	50	3	16.4
Van Ryn Deep...	1,900	65	7	21.84
West Rand Consolidated..	*1,850	100	4	11.5

* 20 only. [1] New stamps only.

1,380 Heavy Stamps.

There are in all erected on the Rand to-day 1,380 stamps of over 1,750 lbs. weight, and of these between eleven and twelve hundred are at work. It seems clear that these weights are considerably greater than those of other gold mining fields, whilst the duties, too, are substantially higher. The world's record duty for gravitation stamps will be obtained by the Shamva Company, in the Abercorn District of Mashonaland, but it should be pointed out that these heads are of Nissen pattern, and are not of ordinary Californian type, such as this article is concerned with.

Comparison with America.

The stamp weights referred to in the foregoing are substantially heavier than those recorded in respect of United States gold mines. Most of the installations in the United States are from 1,000 to 1,200 lb. per stamp. On the Mother Lode of California they vary from 850 to 1,250 lbs., with an average, for 24 mills containing 1,090 stamps, of 1,000 lb. Heavier stamps, 1,400 lb., have been installed in the United States, and last year 1,500-lb stamps were specified for the Commonwealth mill, Pearce, Ariz. We note an opinion recently expressed by a United States mining authority that on the Rand the weight of stamps appears to have reached a maximum. The accuracy of this view is open to question. Year after year the duty and the average weight of stamps operating along the Main Reef Series increases. A tendency to ask for larger and larger tonnages from a given number of stamps is evident, in other words a disposition to intensify milling efficiency is to be observed. It is not unlikely that the deliberations of the Sunday Observance Commissioners will tend towards further intensification of efficiency. That is to say the falling weights of Rand stamps may be further increased and the duties correspondingly raised.

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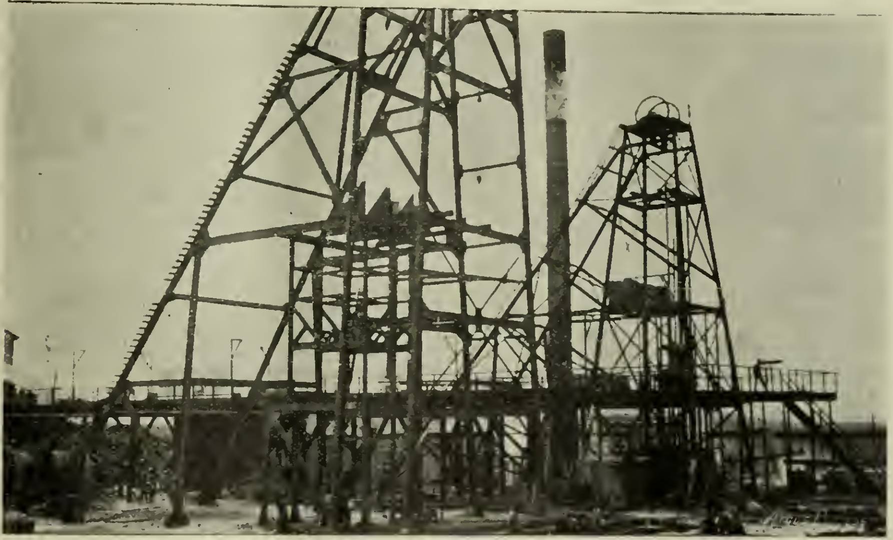
THE MESSINA COMPANY'S TWIN SHAFTS.

Reasons for the Adoption of this Method—Mr. Warriner's Views on the Subject.

One of the most important features in the recent development of the Messina Copper Mine has been the sinking and equipment of a new vertical shaft known as the No. 5. This shaft is only 50 ft. distant from the No. 4, and in view of the interest that has recently been taken in local mining and engineering circles in the practice of sinking twin shafts, the accompanying photograph, which was taken a few days ago and which shows the No. 5 headgear just completed and in immediate proximity to the No. 4 shaft is of considerable interest. In order to make the position clear in regard to the functions of this new shaft and the reasons which induced the management to favour the twin vertical idea rather than to sink a new shaft at a considerable distance from the No. 4, it may be recalled that in the earlier days of the proposition the No. 3 shaft was one of the most important points of the property. This shaft, which was down to the 3rd level, had been timbered with round bush timber, and, when the question of further sinking was considered, it was thought advisable to enlarge No. 4 old shaft (a two compartment shaft down to 2nd level) and sink it to 800 ft. The North and Middle lodes, including Bonanza section, so far account for three-fourths of the developed ore, and No. 4 shaft was more convenient for these lodes, and was also at the highest level on the surface, and thus most adaptable for delivering ore to any new reduction plant. This No. 4 shaft was only intended to replace No. 3. It is a three compartment shaft, each compartment being 4 ft. by 5 ft. 6 in. in the clear, and timbered with 8 in. by 8 in. pitch pine for two sets above and below each level, and 6 in. by 6 in. at other sets. The guides are 6 in. by 4 in. pitch pine; and cages are run in the shaft, capable of carrying 20 cu. ft. trucks. At the surface and at the 4th and 6th levels landing dogs are fixed in the shaft for the cage to rest on, and the skipman is responsible for seeing that these dogs are open before he takes the cage to a lower level. When the development in the mine improved, and the prospect of a larger tonnage was assured, the question of a second shaft arose, and it was decided to sink a new No. 5 shaft 50 ft. to the west of No. 4, and of practically the same dimensions, each compartment being 4 ft. 6 in. by 5 ft. 6 in. in the clear. The sinking of a new twin shaft was decided on in order to concentrate boiler equipment, etc. By sinking the twin shafts all ore and water can be brought to either shaft and the underground workings will be accessible from either shaft. This new No. 5 shaft has been equipped with a direct acting Corliss winding engine with 8 ft. drums, with a capacity of 7 tons from 2,000 feet. There has also been erected a 72 ft. steel headgear. In our issue of a week or two ago, we reproduced a photograph showing the twin shafts at the Modder Deep Levels mine, which is, we believe, the only South African proposition, in addition to Messina, which is equipped on the twin shaft principle. Further attention has been directed to this idea in mining by the suggestion of Mr. Woodburne, the manager of Messina, that in equipping a new property additional efficiency could be obtained in the lay-out by sinking two shafts close together instead of at a distance of a thousand yards or so. This remark was made in the course of discussion of Mr. R. C. Warriner's paper on centralization at the Crown Mines. Mr. Warriner, in reply, said that from a ventilation and mining point of view, he could not possibly see what advantage would be gained by sinking two shafts close together as compared with sinking one large vertical shaft, except that it meant providing duplicate equipment in case of breakdown. As breakdowns were of very rare occurrence in vertical shafts, it appeared to him that it would be unnecessary duplication. In the case of the Messina mine, however, shaft sinking policy was very carefully thought out, and having regard to the extent of the shute and the concentration of the best ore in the Bonanza section around these shafts, the twin vertical idea at the copper mine was considered to possess very substantial advantages over any other method.



Messina No. 5 Shaft: Erection of New "Twin" Headgear.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of February, 1914:—Tons crushed, 3,452, yielding 1,794 fine ozs.; estimated value of output, £7,554; estimated profit for month, £4,359.

THE WESTERN AND FAR WESTERN WITWATERSRAND.

A Lifeless Field of Immense Possibilities—Experience and Prospects along the Randfontein-Potchefstroom Line.

WHILST the Further East Witwatersrand has recently engaged a tremendous amount of attention, both locally and in Europe, the other adjunct of the Central Main Reef Series, the West Rand—as Mr. S. C. Black pointed out in our last issue—has remained in a dormant state, and it is now but seldom that one hears this area mentioned save in connection with the ordinary routine of production at Randfontein, the West Rand Consolidated or the Luipardsvlei Estates—the only steadily producing gold mines situated beyond the Witpoortje break, and therefore in the West Rand proper area of the Witwatersrand. Between Roodepoort and Krugersdorp there are a number of propositions of low grade and disturbed nature, which have never yet yielded any real measure of profit, but which, under more favourable conditions in regard to working costs, should prove payable concerns. We have in mind, as we write this, the French Rand, Tudor and Lancaster West Mines.

TWO HUGE GOLD FIELDS.

Quite apart from these ventures there are great possibilities of expansion of mining development on the Western Rand section in the directions of (a) prospecting between the Randfontein line of reefs, which have a north and south strike, and the more or less east and west line of outcrop from Witpoortje to Krugersdorp; and (b) prospecting for extensions of the Main Reef Series to the south and west of the extreme southern section of the Randfontein Mines. For the moment it is unnecessary to go into the abstruse geological questions which concern these areas. Reef conditions to the west of the Witpoortje break have always constituted a stratigraphical puzzle, although Dr. Mellor's recent investigations have assisted materially in clearing up some of the long-standing bones of contentions that have for years past existed amongst geologists in regard to the stratigraphy of this portion of the Witwatersrand. It will here be sufficient for the moment to state that there are undeniable indications that certain gold-bearing strata might profitably be sought for in both the areas mentioned above. In regard to the section lying between the Witpoortje break and Randfontein, it will be recalled that Messrs. A. Goerz and Company undertook extensive boring operations on the farm Rietvlei to the West of Randfontein, some time ago. This firm also sank many drill holes between Middlevlei and Potchefstroom, but in each area negative or indeterminate results were secured.

THE POTCHEFSTROOM-RANDFONTEIN LINE.

It cannot, however, be assumed that because of this, all this vast extent of territory is proved to be without prospects. On the contrary, it is generally held by mining men, who are most conversant with actual conditions, that some day a vast annexe of Witwatersrand mining will arise out of the Frederickstad-Potchefstroom line of country. Mr. S. C. Black, in our last issue, referred to this section as "a field full of immense possibilities for the future of gold mining in the Transvaal." To-day the only points of activity along this line are at the Quest (the old Buffelsdoorn), and the Machavie Mines, and at this latter proposition activity—productive activity at any rate—is of a very desultory nature. Nothing is being done at the Western Rand Estates property, on Gemsbokfontein, but, despite the quantities of water encountered in sinking the shaft through the aqueous dolomites, there is no reason why development of this mine should not be proceeded with. The reef values encountered in the borehole were good, and after all, sinking through watery strata presents no very great difficulties to modern practical science, as exemplified in the Kind-Chaudron, Poetsch and other methods.

What is really needed is some movement initiated by responsible financial Houses, and fostered and encouraged by the Government to give a stimulus to mining in this whole area.

DR. MELLOR'S VIEWS.

We cannot conclude this subject without referring to the most important work carried out by Dr. Mellor in this area. In concluding his report on the Western Witwatersrand, Dr. Mellor wrote: "To summarise by way of review the main features presented by the block of country west of Randfontein, it may be said that in it, as compared with other portions of the Rand, the Lower Witwatersrand System shows a very great width to outcrop, due partly to a prevailing low degree of dip, and partly to the greater thickness of the formation, especially that portion between the Orange Grove Quartzites and the West Rand or Coronation Slate. The low dips prevailing over the greater portion of the area give place to a much greater inclination of the beds in its eastern portion, where there is also manifested a constant tendency towards duplication of portions of the sequence. As a whole this block of country appears to be separated from that to the east by a north and south break occurring in the neighbourhood of the western boundary of Randfontein, and referred to as the West Rand Fault. One of the most interesting points connected with this piece of country is its bearing on the possible future course of the Witwatersrand System beyond the point at which it disappears below the Dolomite to the south-west. The general trend of the formation throughout is fairly constant, but the furthest portions of the area are so broken in character that, while the extension of the system as a whole in a south-westerly direction is clearly indicated, the location of any particular horizon below the Dolomite to the south-west may be a matter of considerable difficulty, especially with regard to that portion of the system which lies above the West Rand Slate horizon."

It will be noted that whilst the geologist anticipates considerable difficulty in the location of any particular horizon below the Dolomite, he finds that the extension of the system as a whole in a south-westerly direction is clearly indicated. Surely this is a field well worthy of further investigation, well worthy, too, of direct and substantial assistance from the Government, if need be, for, as Mr. Black says, its possibilities are immense.

Robinson

The report of the directors of the Robinson Gold Mining Co., Ltd., for the three months ended December 31st, 1913, shows that the total working expenditure is £117,505, the cost per ton milled 11s. 10d., and the value per ton £1 15s. 10d. The report contains the following general remarks. A small footage of development was accomplished in the lower levels of the mine, and the reef disclosures on both reefs are considerably higher than those of the previous quarter. Owing to the continued shortage of native labour the tonnage mined was lower by 14,091 tons, but a large tonnage, viz., 14,036 tons, was taken from the surface dump, thus the tonnage milled was only 2,700 tons lower; the yield was lower on account of the inclusion of this ore from surface dump, and with increased costs of 9d. per ton milled, the profit from current treatment was £15,193 less. As anticipated in the last report, sands filling was started during the quarter, and 76,580 tons of sand were lowered into the crushed area of the lower levels at No. 2 shaft.

Transvaal G M. Estates

The following are the particulars of this company's output for the month of February, 1914:—Central Mines: Tons crushed, 11,300, yielding 7,499·357 fine ozs. Elandsdrift Mine: Tons crushed, 605, yielding 641·328 fine ozs. Vaalhoek Mine: Tons crushed, 1,340, yielding 599·854 fine ozs. Estimated value of output, £36,805. Estimated profit for the month, £20,485.

WELFARE WORK ON THE MINES OF THE RAND.—II.

Shares for Workmen—District Visitors for Men's Homes—More About the Influence of Gardens—"Safety First" and a Bonus System—Lessons from U.S.A,

THE following is the second instalment of facts gleaned from recent reports of the United States Steel Corporation, showing what that organization is doing for the welfare of its workmen. With certain obviously necessary modifications, there is no reason why the Rand should not do likewise.

SHARE SUBSCRIPTION PLAN.

In 1903 there was inaugurated a plan, under which shares of the United States Steel Corporation were offered to all employees upon easy and especially favourable terms, which involve benefits beyond those to the ordinary stockholder. This plan has been continued each year since its origin. If death occurs to an employee who has subscribed for shares and made payments under this plan, his estate receives the unpaid premiums for the full five-year period and a *pro rata* share of the premiums undivided at the time of death. On December 31 1912, more than 32,248 employees were shareholders under this plan. Their aggregate holdings amounted to more than 125,848 shares. It is impossible to ascertain how many employees, in addition to those yet receiving the special benefits that continue for five years, hold shares upon which these special benefits have ceased to be paid, but it is believed that their numbers would greatly increase the figures here given.

The annual cost to the Corporation of the Employees' Share Subscription Plan is at the present time approximately $1,000,000.00

VISITING OR DISTRICT NURSES.

District or visiting nurses are employed by the mining companies of the United States Steel Corporation in a number of mining districts. Some of the manufacturing companies have also employed these nurses. Usually they are under the direction of the local company physician, or plant manager, although in some cases they are under the City Visiting Nurse Association. Their duties are to visit the homes of employees, especially where there is sickness and the family would be benefited by the assistance or instructions of a trained nurse; to render such aid as will add to the comfort and welfare of the families; and to instruct and direct in the care and feeding of infants. These nurses explain the proper preparation of all food and advise in the matter of economical purchasing; discourage anything and everything that does not tend to produce good morals, and teach the value and necessity of cleanliness and the benefits of fresh air and sunshine. At the South Works of the Illinois Steel Company, where the nurse employed is a member of the Visiting Nurse Association, there has been organised among the superintendents and foremen a "Good Fellow Club" to work in co-operation with the nurse. The members of the club contribute fifty cents per month (or any amount greater or smaller which they may care to contribute) to a fund to be drawn upon immediately by the nurse for relieving such distress as requires instant attention, temporarily, and until more permanent relief can be provided through the regular avenues, involving the delay attendant upon regular procedure. The nurse uses this fund as she deems wise. It may be for the purchase of a bed, or necessary food and cooking utensils or a special diet for a sick person, clothing for the children, etc., etc. During the summer this "Good Fellow Club" maintained a small playground on some vacant lots in a congested neighbourhood, near the mill. A woman was in constant attendance, and the nurse made several visits a day. In this playground the little children would be watched and cared for, and it was the general opinion that many cases of illness among the children had been prevented.

VEGETABLE AND FLOWER GARDENS.

Each year it is customary for the H. C. Frick Coke Company to offer prizes to its employees for the best vegetables and flower gardens. The following comparison of sales by the Union Supply Company at the works of the above Company indicates the increasing enthusiasm with which the employees are entering into these contests:

	1912.	1913.	Increase.
Potted flowering plants	17,723	30,029	60%
5c. packages of flower seed	10,580	15,071	42%
Cabbage plants	10,078	14,480	44%
Tomato plants	21,118	33,654	59%
Onion sets (bushels)	410	508	24%
5c. packages vegetable seeds ...	52,021	67,362	29%

Potted plants comprised of geraniums hyacinths, jonquils, azaleas, ferns, tulips, petunias, begonias, and some small plants in hanging baskets. Vegetable seeds comprised of lettuce, cucumbers, celery, parsley, carrots, turnips, parsnips, beets, cauliflower, spinach, peppers, radishes, beans, peas squash and corn. Flower seeds comprised of sweet peas, pansies, alyssum, mignonette, forget-me-nots, petunias, four o'clocks, stock heliotrope, poppies, phlox, morning glories, carnations and nasturtiums. During the season of 1913, there were 6,296 cultivated gardens, being 91 per cent. of the total number that could have been planted, in the H. C. Frick Coke Company mining towns alone. The estimated average value of each vegetable garden was $27.50, based upon the prices at which garden produce was sold by the stores in the vicinity. This meant a saving of $173,140.00 to the employees of that Company. There were awarded 113 first prizes, 113 second prizes and 79 third prizes.

The following notice was posted throughout the camps of the Tennessee Coal, Iron and Railroad Co.:

TO EMPLOYEES
TENNESSE COAL, IRON AND RAILROAD COMPANY.
REDUCE THE COST OF LIVING.

Plant a Fall Garden, Pay Less to the Commissary for Vegetables and Start a Bank Account with the Money Saved.

It has been a noticeable fact for several years that each season more gardens were being planted by employees of the Tennesse Coal, Iron and Railroad Company than had been the case the previous year. This year over 50 per cent. more gardens were planted than in 1912. and it is hoped the number will continue to increase until every employee having available space will have a garden.

ACCIDENT PREVENTION.

Safety Committeees have been organised for practically every operation throughout the subsidiary companies of the United States Steel Comporation; 4,678 employees were members of these committees during 1912. The personnel of these committees, especially those made up of workmen, is changed periodically in order to extend the individual interest in safety. Since 1906, when the Corporation actively took up the work, approximately $5,000,000.00 has been spent on safety work, and it is felt that to a large extent those accidents for which the employer is responsible have been eliminated. An analysis of the causes of accidents shows that a large proportion of them are due to the carelessness of the workmen. In an endeavour to eliminate those accidents a very active campaign of education was started by all of the subsidiary companies some time ago. Entertainments are given at the different plants or mines. All employees and their families are invited. Typical unsafe practices are shown in contrast with the proper and safe method of doing the work. Motion pictures and lantern slides are employed, and are relieved by music and other things of an entertaining character. Twenty-one such entertainments were given by one company this year. Another company, in conjunction with a Public Service Company, entertained at different times some 8,000 school children. They were shown moving pictures of the dangers of the street and their play. It is believed that all of this work is beneficial in stimulating the interest in safety. Many other plans have been inaugurated, the most recent of which is the giving of monthly prizes to each man in the departments having the best records for safety. One company has established a bonus plan which applies to all foremen; and cash bonuses, based upon the per cent. of reduction of accidents in each particular department, are paid at the end of the year to each foreman. In some companies, suggestion boxes are located at convenient places throughout the plant for the convenience of all employees who are not members of committees but desire to make suggestions. Prizes are awarded periodically to those making the best suggestions. Safety precepts are printed on pay-envelopes, the wordings being changed each pay day. These precepts are displayed on signs at the entrance to the works and are in plain view as the employees go to and from work. They are also printed on forms used in the plant; on lead pencils, cigars and matches, lapel buttons, watch fobs, drinking cups, etc. Thousands of calendars are distributed to the employees each year with some words of caution printed on each leaflet for the month. Everywhere there is an earnest appeal to the employees to use care in doing his work to keep "*Safety*" in mind at all times.

Barnato Group.

The following are the operations of the Barnato Group for the month of February:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.	Gross Profit including sundry Revenue.
Cons. Langlaagte ...	70	37,800	£50,363	£20,025
Ginsberg	75	13,777	17,070	4,335
Glencairn	155	18,970	13,781	2,374
New Primrose	155	21,700	27,431	13,465
New Rietfontein ...	110	12,130	12,305	262
New Unified	60	11,590	13,825	1,868
Quest	35	4,267	2,927	802
Van Ryn Deep ...	70	34,200	56,320	25,429
Witwatersrand	215	38,410	47,561	22,495
February totals .	945	192,884	£241,583	£91,055
January totals .	925	197,278	241,659	£87,277

Monthly gross profits: January, £87,277; February, £91,055.

POSITION AND PROSPECTS OF THE NEW HERIOT.

Annual Review of Operations—A Life of Six Years.

THE New Heriot profit for the year, viz., £82,612 4s. 9d., showed a decrease on that of 1912, which, however, included the gold reserve declared in March, 1912. The shortfall in profit is due to circumstances which the directors "would fain hope may never again occur." After due consideration the Board decided, in May, 1913, to reduce the rate of dividend to 35 per cent., and in view of subsequent occurrences it was expedient to revert to the former rate (40 per cent.) for the last half of the year. The amount absorbed by the two dividends which were actually paid (35 per cent. in May and 35 per cent. in November) was £80,500. The capital expenditure for the year amounted to £2,007 16s. 7d. Compared with last year the revenue from the ore crushed and sands treated shows a reduction of 2s. 5.7d., and there is again an increase of 9.6d. per ton in the working costs. The tonnage shows a reduction of 4,502 tons. At the end of the year, the developed payable ore reserves were estimated at 581,124 tons as against 590,742 tons at 31st December, 1912. The grade for 1913 was the same, viz., 8.1 dwts. The net loss for November and December, 1913, amounted to £3,913. At the annual meeting held the other day the Chairman remarked that but for the abnormal conditions the Consulting Engineer expresses the opinion that we should have had a profit for each of these two months, and instead of a reduction in the total profit for the year there would in all probability have been an increase.

THE FUTURE.

"I now turn to a subject which has caused some inquiry on the part of shareholders, viz., the 'life' of the mine. The Board considers it desirable that I should place before this meeting the estimate upon which the Union Government bases its calculations in connection with the Mining Taxation Act of 1910. The official notification received from the Government Mining Engineer fixes the life of the mine for profits tax purposes at six years from the 1st January, 1912. It is difficult to accurately determine the duration of the 'life' of a Rand mine, and it has been demonstrated more than once that it is not expedient to proclaim any Main Reef proposition as 'worked out.' The directors associate themselves with the acting manager and the consulting engineer in looking forward to a prosperous year. There are certainly reasonable grounds for doing so. In August, 1913, the Board of Directors granted Mr. Robinson, the manager, leave of absence to proceed to Europe. It is with great regret that I have to inform you that on Monday we received a cablegram from our London Office announcing Mr. Robinson's death at a sanatorium. During the period of Mr. Robinson's managership, he enjoyed the fullest confidence of the Board, and carried out his duties to their entire satisfaction. I am sure that shareholders will join with me in the motion which I now propose, that our sincere sympathy be expressed to Mrs. Robinson in her great loss. To Mr. Howard Warren, the acting manager, the mine staff, and the secretary and staff at Head Office I wish to convey the appreciation of the Board."

ADVERTISING OIL IN MADAGASCAR.

Light on the Sakalava Company—A Glowing Report by Mr. Dufty.

WE take the following from an advertisement appearing in the *S.A. Review*, apparently for the benefit of Capetown oil investors. Our readers will doubtless regard it with a more critical eye:—An informal meeting of the subscribers and others interested in the Sakalava Madagascar Proprietary Oil Fields, Ltd., was held at Weddell's Hotel, Main Street, Johannesburg, when Mr. W. H. Dufty gave an address relating to the circumstances which led to the discovery of oil in Madagascar. Mr. Lewis A. Stewart (one of the provisional directors) presided over a large attendance. In the course of his address, Mr. Dufty said that in 1907 the Sakalavas decided to direct their attention to the discovery and securing of oil-bearing ground in Madagascar. With this end in view Mr. Meiklejohn and he met at Maintirana at the end of November, and struck east, entering the Bemaraha Mountains. These were found capped with old jurassic corals (in places 100 feet thick), which doubtless were in part responsible for their existence by having prevented disintegration and the consequent wearing away of the soft sandstones and clays below. It was on leaving these mountains that they met with the first indication of petroleum in the form of a dark grey sandstone which had formerly been impregnated with oil. During the next few years they had abundant evidence that they were in the neighbourhood of an oil field. On setting fire to the grass, when Dr. Henderson was inspecting it, they found that the oil had been started out of the dry rock by the heat. They had only to land their drill and erect it; the cost would not be more than £1 per ton, and the drill could be got there in eight days. On the east flank on anticline "C" of the property he had the luck to discover a fine seepage covering several square yards, having a thickness of 30 feet. The anticline formed a ridge of hills running about N.N.W. and S.S.E. The Madagascar Oil Development Company had its boundary about one and a half miles east of that seepage or seepages. One he quoted especially, where the eastern flank had been holed out into a deep gulch, laying bare an immense bed of oil sands, or rock, literally reeking with petroleum and dripping everywhere.

PEGGING THE GROUND.

In conclusion the lecturer said that the ground had been well pegged, and the surveys, if not mathematically correct, were nearly so. They had a splendid property and an unheard-of area. They had every evidence known on other oil-fields of the existence of rich stores of petroleum. They had saltlicks, gas, sulphur springs or sulphuretted hydrogen, on different parts of the property. There were monoclines, anticlines, domes, and, lastly, the crude oil itself, which had been forced up to the surface through the several lines of weakness by water and gas pressure below. There was a beautiful river up which to carry the machines and down which to send the oil. They had cheap labour, cattle for transport was cheap, and there was plenty of wood for steam. Favourable reports had been made on the property by the best brains of Europe and by men of long standing and wide experience all over the world.

MINING INSTITUTE.
TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.
Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S. MECHANICAL ENGINEER'S.
MINE OVERSEER'S. ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S,
by Class, Private Tuition, and Correspondence.
100 PER CENT. PASSES IN RECENT EXAMINATIONS.
St. James' Mansions, Eloff Street.

CHAMBER OF MINES' ANNUAL REPORT.

Points from the Record of Work Done and Statistics Collected in the Year.

FROM the annual report of the Chamber of Mines we take the following:—

The native labour position on mines and works at the end of 1913, as compared with the position at the end of 1912, may be summarised as follows:—At the 31st December, 1913, there were 71,788 East Coast natives from South of Latitude 22 deg. S. employed by mines and works as against 79,792 at the end of 1912. This shows a decrease of 8,004. A decrease of 5,750 has to be recorded in respect of natives employed on mines and works from the Mozambique, Quilimane, Tete and Portuguese Nyassa districts at the 31st December, 1913, as compared with the end of 1912. The actual figures for the two periods are 11,377 and 17,127 respectively. The number of these natives will continue gradually to decrease, consequent upon the prohibition of further Tropical recruiting, which was decided on by the Union Government on the 10th May, 1913. The number of natives from the Cape Province employed by mines and works at the end of 1913 shows a large decrease as compared with the previous twelve months; the relative figures being 45,756 at December 31st, 1913, as compared with 67,491 at the end of 1912, a diminution of no less than 21,735. The Transvaal Province shows a drop of 4,315 natives; Basutoland a drop of 1,330; and Natal and Zululand a drop of 4,657 at the end of 1913, as compared with the end of 1912. Taking the total number of natives employed on mines and works at the 31st December, 1913, as compared with the end of 1912, a decrease of 47,120 appears, due, in a great measure, to the industrial unrest, which occurred on the Witwatersrand in July last. It has also to be recorded that the wastage, that is, natives taking their discharge, etc., amongst members of the Witwatersrand Native Labour Association for the year 1913, shows an increase of 9,253 as compared with the year 1912. The first report, dated May 26th, 1913, of the Select Committee on Native Affairs, appointed by the House of Assembly during the 1913 session, dealt with the agreement between the Portuguese Government and the Witwatersrand Native Labour Association, dated December 4th, 1912. The report states (1) that there is no objection to the principle of deferred pay, and (2) that no alteration be made in the initial period of service provided for in the Convention, at any rate until the report of the Tuberculosis Commission is received. It further recommended that the recruiting of natives in the Province of Angola should not be sanctioned by the Union Government. The Tuberculosis Commission has not yet issued its report, and, in consequence, it has not been possible to give effect to the above agreement.

Immigration Regulation Act (Act 22 of 1913).—This Act came into force on August 1st, 1913. The Chamber made representations to the Government on two points: (1) To provide that natives from existing sources of supply outside the Union should have the right of entry without being required to pass the dictation test laid down in the Act; and (2) to provide that natives permitted to enter the Union, and those residing therein, should have the right to move freely from Province to Province without being required to pass any such test. The necessary provisions are contained in the Act covering both the above points, with the exception that natives domiciled north of latitude 22 deg. South of the Equator are not exempted under the Act from the dictation test.

Grading of Mealies.—The Chamber had reason to believe that owing to the inferiority of the 1913 crop of maize the Government had been approached to lower Government standard of maize grades. The confidence established by the creation of these Government grades enabled contracts to be entered into, reliance being placed on a particular grade to secure the required quality. Representations on the subject were made to the Government by the Chamber, and the wording of the definitions of the various grades, which were established in June, 1911, and amplified in 1912, has not been amended.

Native Grievances Commission.—In June last the Minister for Native Affairs made a statement in Parliament on the inadequacy of the attention paid to native labourers by mine medical officers. The Chamber inquired of the Native Affairs Department if it might be furnished with further details in respect of the allegations, but the request was refused. In Auguest, Mr. H. O. Buckle, Resident Magistrate, Johannesburg, was appointed a Commission to investigate the conditions under which natives are engaged for and employed on the mines of the Witwatersrand, and if any grievances or abuses were found to exist, to make recommendations with a view to the removal thereof; to inquire into the control capable of being exercised over natives houses in compounds in the Witwatersrand area; and to make recommendations as to what measures should be taken with a view to safeguarding life and property in the event of any industrial or other unrest or disturbance. Evidence was given before that Commission by the Witwatersrand Native Labour Association generally on the recruitment of natives by the Association up to the time of registration of the native labourers to the various mining companies. The question of the adequacy of medical attention paid to mine natives being included in the terms of reference of the above Commission, evidence was given before the Commission by various mine officials on the subject. The report of the Commission had not been issued at the end of the year.

Commission on Assaults on Women.—The Commission issued its report during the year. The more important of its recommendations affecting the mining industry were:—The establishment of the close compound system; the sale of kaffir-beer of a degree of alcholic strength not exceeding 5 per cent. to be permitted in Municipalities under proper supervision and control, and for it to be compulsory for employers on the mines to issue to labourers a certain quantity of kaffir-beer daily, the deportation of alien illicit liquor sellers; and the simplification of the Pass Laws.

Fees on Native Passes.—In order to place the Transvaal in respect of the fees payable per month on native passes on the same level as the other Provinces, the Chamber in February made representations to the Government for the reduction of these fees to 1s. The reduction was further urged on the ground that the tax was raised entirely from the urban population. In reply, the Government stated that it was unable to entertain the Chamber's request at that time, as the revenues derived from the tax had been assigned to the Provincial Administration of the Transvaal under the Financial Relations Bill.

GENERAL HEALTH CONDITIONS ON THE MINES.

The general health of natives employed on mines showed a gratifying improvement during 1913, the mortality figures, from disease only, being at the rate of 22.10 per thousand per annum. This is the lowest figure on record on the mine, and it is confidently hoped that, as a result of the visits of Sir Almroth Wright and Surgeon-General Gorgas, and with the establishment of the South African Institute for Medical Research in working order, the mortality will show a still further decrease. Deaths from pneumonia, while showing a satisfactory decrease, are still more numerous than deaths from any other disease.

MINING EDUCATION.

It is gratifying to be able to record that an improvement took place during the year, not only in the numbers applying for admission to the Government School, but also in the class of applicant, both as regards physique and the standard of education. As was to be expected, a slight falling off in numbers occurred after the strike in July, but at the end of the year the ground lost had been regained, and the applications for admission under consideration were more than sufficient to fill the school The question of what period of apprenticeship should be credited to pupils who have satisfactorily completed a three and a half years' course at one of the Transvaal Trade Schools is still in abeyance, awaiting a further proposal from the organiser of technical education. In the course of the year, the standard of education required by the mines before taking on youths as indentured apprentices was raised to Standard V., in consequence of Transvaal Ordinance No. 7 of 1912, insisting on compulsory attendance at primary schools until Standard V. be passed.

MINERS' PHTHISIS ACT, 1912.

The correct interpretation to be placed upon the definition of "miner" under the above Act being doubtful, the Chamber, in conjunction with the Miners' Phthisis Board, has arranged for a test case to be brought with a view to obtaining the decision of the Courts as to what classes of employee are to be included in the definition. The action had not been tried at the end of the year.

TRANSVAAL MINERS' PHTHISIS SANATORIUM.

The applications for admission to the Sanatorium during the past year contained a larger proportion of men in the earlier stages of miners' phthisis than formerly. Such patients are more likely to benefit from the Sanatorium treatment than those in the more advanced stages of the disease, and it is gratifying to state that no less than 68 patients left the Sanatorium during the year improved in health to a greater or less degree. On the other hand, 48 deaths have to be recorded. The Sanatorium is now almost full. The maintenance costs for the year amounted to approximately £9,800. One half of this expenditure was provided by the mining companies through the Chamber.

MINERS' PHTHISIS PREVENTION COMMITTEE.

In June this committee issued an interim report giving details of experiments and investigations carried out. Towards the end of the year, it decided to extend its programme of investigation by carrying out a series of dust determinations on very mine on the Rand.

FINANCIAL RELATIONS ACT (ACT 10 OF 1913).

This Act came into force on the 1st April, 1913. So far as it more particularly affected the mining industry, the Act adopted the principle recommended by the Financial Relations Commission and submitted to it by the Chamber in its evidence, namely, that the raising of revenues on the exploitation of minerals or precious stones should be reserved for the Union Government.

TRANSVAAL PRECIOUS AND BASE METALS ACT AMENDMENT ACT (ACT 18 OF 1913).

This Act came into force on June 19th, 1913. It contains provisions relating to the trading by natives and coloured persons in locations on proclaimed land and important amendments modifying the definition of unwrought precious metal as defined in the Precious and Base Metals Act No. 35 of 1908 (Transvaal). Wide powers are taken in the Act to make regulations for the better prevention of unlawful dealing in unwrought precious metal. The regulations in terms of the Act had not been promulgated at the close of the year.

ADMINISTRATION OF ESTATES ACT (ACT 24 OF 1913).

This Act came into force on the 1st October 1913. The Chamber had made certain representations with a view to simplifying the procedure of obtaining Letters of Administration upon the death of any person ordinarily resident abroad and not possessing any property in the [illegible] other than shares in a Company, and the Act embodies the Chamber's recommendations.

MINING TAXATION ACT, 1910.

The method of the treatment of "excess development," under the provisions of the above Act was the subject of a memorandum by the Commissioner for Inland Revenue. The memorandum elucidated the meaning to be placed upon the term "excess development," and established a uniform method of treating this question in the accounts of mining companies. Two questions of considerable importance under the above Act arose in the course of the year, and are to be decided in the Law Courts. One, whether the assets of an absorbed company, which the Government regarded as amortisable by that company, are entitled to be amortised under the Act by the absorbing company, or only such portion of them as is in proportion to the consideration given by the absorbing company to the absorbed company for its total assets; and (two) whether in the interpretation of the provisions governing the calculation of the amount of the allowance for amortisation of capital expenditure, the war period is to be included in the life of the mine, and whether readjustments can be made on an alteration in the life of the mine of payments assumed under the Act to have been paid into the hypothetical sinking fund established upon the commencement of production until the coming into force of the Profits Tax Proclamation, 1902.

BEWAARPLAATS MONEYS APPLICATION BILL.

This Bill was introduced during the last session of Parliament, and provided that the registered owner of the land upon which the bewaarplaats is situate was to be paid one-half of the moneys received by the Crown in respect of any lease or other contract disposing of the right to mine underneath any bewaarplaats. The Bill affirmed the principle recommended in the Report of the Bewaarplaatsen Commission of 1909-1910, and which the Chamber had submitted for the Government's consideration in 1912. The Chamber submitted certain amendments on the provisions of the Bill, which, however, owing to the prorogation of Parliament, was not proceeded with, the Government stating that it would be reintroduced next session.

LAND SURVEY BILL AND REGISTRATION OF DEEDS BILL.

The Chamber made further representations on the new drafts of these Bills, which in the course of last session were passed by the Senate without embodying the Chamber's amendments. They did not, however, become law, as they had not passed the House of Assembly before the prorogation of Parliament.

PATENTS.

At the end of 1912 five applications, to which the Chamber had lodged opposition, were still sub judice. All the applications, however, were abandoned. During last year 99 specifications were reported upon by the Patients Committee. In 79 of these cases it was decided that no action should be taken by the Chamber, but with regard to the remaining 20 specifications, opposition was entered. In 3 cases the oppositions were withdrawn; in 5 cases the applications were abandoned; in 5 cases the applicants amended their specifications to meet the objections of the Chamber; whilst 7 of the cases were outstanding at December 31st, 1913. In January, 1913, the Commission appointed in June, 1911, to consider a report upon the amendment and consolidation of South African Laws relating, inter alia, to Patents in the Union, issued its report. Attached to that report was a draft Bill for consolidating the Laws of the various Provinces of the Union relating to Patents and Designs. The Bill was not introduced during the last session of Parliament. While not adopting the principle of an official examination on the English model as recommended by the Chamber, the Bill embodies a large number of the suggestions put forward by your Executive Committee.

OCEAN FREIGHT ON BULLION.

The negotiations between the Chamber and the Union-Castle Mail Steamship Company, Limited, for the obtaining of a reduction in the freight rate on raw gold exported to Europe were satisfactorily concluded, and an agreement has been entered into between that Company, the Gold Mining Companies, and the Banks concerned in such export, whereby the rate of freight has been reduced from 5s. per cent. to 4s. 3d per cent., the agreement to be in force for the period of the Ocean Mail Contract.

THE POSITION OF THE TRANSVAAL G.M. ESTATES.

Recent Rumours Unfounded—Ore Reserve Position Maintained—Improvements at Elandsdrift and Vaalhoek.

IN view of the recent groundless rumours circulated in regard to the Transvaal Gold Mining Estates, the following, from the quarterly report is of particular interest:—The profit at the Central Mines shows a decrease of £2,448, as compared with the previous quarter. Tonnage crushed increased by 1,050 tons; the yield was ·613 dwt. per ton lower. At Elandsdrift the profit shows a decrease of £829. Tonnage crushed 25 tons less, and yield ·582 dwt. per ton lower. At Vaalhoek the profit is £486 less. Tonnage crushed 130 tons more, and yield ·760 dwt. per ton lower. In the aggregate there is a decrease in profit of £5,281 as compared with the previous quarter, the total profit for the quarter being £67,647. The supply of native labour has continued good at Elandsdrift and Vaalhoek, but at the Central—although there has been an improvement—it has not been up to expectations. There are now indications that the position is improving. The company's operations were in no way affected by the general strike declared on the 13th January by railway employees and others, all work continuing as usual. On the 17th November, 1913, Brown's Hill power station was totally destroyed by fire. The buildings and machinery were fully covered by insurance, and the company's claim has been paid in full. The company's operations have not in any way been affected by the fire. Central Mines: During the quarter development has had to be somewhat curtailed, owing to shortage of labour. The values on the whole have been satisfactorily maintained. Development in the Peach Tree mine to the dip has not yet exposed payable values. On the other hand, Duke's Hill mine, in which development has continued without interruption, has continued to open up well: the first road forming the connection to Columbia Hill was holed through successfully, thus improving the conditions in this mine. Some patches of ore of good value have been opened up in Columbia Hill, east of the Beta dyke. In the Theta, a reef in the shales was intersected in two raises in the centre of the hill, giving excellent results, and a third raise is now being put up at a point further south to prove the continuity thereof. There is nothing of importance to report at the Peach Tree, Brown's Hill, and Graskop Mines. At the beginning of December, two cone classifiers were installed in the cyanide plant, and with better classification an improvement in extraction has been obtained. On the whole, in spite of the decreased development for the period already mentioned, the ore reserves position, so far as can be judged, remains much the same as at the beginning of the financial year. Elandsdrift Mine: The quartz blow continues to be the mainstay of the mine, and the dip section is being developed with good results. The ore reserves are estimated to have increased both in tonnage and grade. Vaalhoek Mine: The river and nek sections are opening up well. The exposure of the extension of reef to the south in the river section is giving good results. It is estimated that there has been an increase in the ore reserves, both in tonnage and value.

Nourse Mines.

The report of the directors of the Nourse Mines, Ltd., for the three months ending December 31st, 1913, shows that the total working expenditure was £116,965, the cost per ton milled £1 2s., and the value per ton £1 8s. 11d. The report contains the following general remarks:—Results for the quarter do not compare favourably with the previous three months, owing to the severe shortage of native labour. The company on the last day of December had in its employ only 3,096 natives. Since the last day of February there has been a continuous shrinkage in the number employed. The South Nourse incline shaft was sunk 81 feet, and the 22nd level station was cut. Connection was established early in the quarter between the South Nourse shaft and the west incline shaft. No. 4 shaft was deepened 103 feet, making its total depth 429 feet. The haulage from the bottom of No. 2 incline shaft to the South Nourse was put into commission, and is working satisfactorily. Rock is now being hoisted through the South Nourse vertical shaft, whence it is conveyed by a steam locomotive to the mills. The sun of £1,463 was spent on capital account, leaving an amount of £4,416 still to be expended cn

The best "Reef Traveller" is the *South African Mining Journal.*

PROPOSED NEW INDUSTRIAL LEGISLATION.

Details of Bill to Deal with Strike Disturbances and Workers' Protection.

The following is the text of the Peace Preservation and Criminal Law Amendment Bill—" to make special provision for the maintenance of order and public safety in times of actual or apprehended grave disturbance of the public peace and to amend the law as to riotous assemblies and the dispersal thereof, and further to amend the cromimal laws in certain respects " :—

Chapter I.—" Special provisions for public safety in times of emergency"—confers powers on the Government and "Control Officers" very similar to those recently put into force under Martial Law.

Chapter II.—headed " Protection of Workmen"—is much more comprehensive and specific than the provisions originally incorporated in the industrial Bills published by the Government in December. We, therefore, publish the essential clauses verbatim :

NO INTIMIDATION.

8. Any person who, inorder to induce or compel any other person to abstain from working or continuing to work or engaging himself to work for any employer, or on account of that other person having worked or engaged himself to work for any employer—(a) threatens or suggests the use of violence to or restraint on that other person or of any of his relatives or dependents, or threatens or suggests any injury to the property of that other person or of any of his relatives or dependents; or (b) besets the premises where that other person resides or works or is seeking work or happens to be on any approach or place adjacent to those premises; or (c) hides any tools, clothes or other property owned or used by, or in charge of, that other person or deprives him thereof or hinders him in the use thereof; or (d) having followed that other person or any one of his relatives or dependants along a public place, or accosted him or any of them therein, behaves towards him or any of them in a disorderly or offensive manner by jeers, jibes, or other like conduct, shall be guilty of an offence.

9. Any person who, in order to induce or compel any other person to join any trade union or similar association does any of the acts specified in paragraphs (a), (b), (c), and (d) of the last preceding section shall be guilty of an offence.

AGAINST " PULLING OUT."

10. (1) Any person who for the purpose of (a) inducing or compelling any person to join any trade union or similar association; or (b) inducing or compelling any person to refuse to accept employment, or to cease work, or to leave any particular piece of work unfinished, or to refrain from returning to work at any time thereafter, or to give notice to terminate his contract of employment, enters on any premises where work is being or is usually carried on shall be guilty of an offence. unless he produce to the Court the written permission of the employer or of the employer's manager to enter on such premises. (2) Any person who, being with the permission of the employer or employer's manager on premises where work is being or is usually carried on, does any such act thereon as is described in sub-section (1) shall be guilty of an offence.

ABUSE AND BLACKLISTING.

11. Any person who (a) verbally, or in any written or printed document published or circulated in any manner, uses any opprobrious epithet or any jeer or jibe to or about any other person or to or about any of his relatives in connection with the fact that such other persons has undertaken, continued or returned to work for any employer; or (b) in order to prevent any other person obtaining or retaining employment or to induce persons to refuse to work or to refrain from working with that other person, causes information to be sent to any person or body of persons within or outside the Union as to the fact that such other person has undertaken, continued, or returned to work or has absented himself or deserted from work or refused to work for any employer in or outside the Union, shall be guilty of an offence.

PUBLIC UTILITIES.

12. (1) If an employee of a local authority or company which, or of a person who, supplies any community with light, power, water or sanitary or transportation services, wilfully and maliciously, either alone or by arrangement with other employees or other persons, breaks a condition or contract of employment with his employer knowing or having reasonable cause to believe that the probable consequence of his so breaking such contract will be to deprive the members of such community or a large section thereof wholly or to a great extent of their supply of light, power, water, or of sanitary or transportation services, he shall be guilty of an offence.

LIFE AND PROPERTY.

(3) If any employee of any employer whatever, wilfully and maliciously, either alone or by arrangement with other employees or any other persons whatever, breaks any contract of employment whatever, knowing or having reasonable cause to believe that the probable consequence of his so breaking such contract will be to endanger human life or to cause serious bodily injury to, or serious injury to the health of, any person or to expose valuable property, whether moveable or immoveable, to destruction, or serious injury, he shall be guilty of an offence.

PENALTIES.

13. Any person guilty under this chapter of an offence for which a penalty is not expressly provided, shall be liable on conviction to a fine not exceeding £200, or, in default of payment, to imprisonment for a period not exceeding two years, or to such imprisonment without the option of a fine, to both such fine and imprisonment.

RIOTOUS GATHERINGS.

Chapter III.—entitled " Riotous Gatherings and the Dispersal thereof "—is identical in terms with " The Public Meetings and Disturbances Bill, 1914," published two months ago except that the clause relating to disorderly conduct of a less serious character has been incorporated in a general chapter. This section reads : " Any person who, at or near a lawful public gathering in whatever place assembled, acts in such a disorderly manner as to prevent or seriously interrupt or disturb the transaction of the business for which the gathering is assembled, shall be guilty of an offence and liable on conviction to a fine not exceeding £25, or, in default of payment, to imprisonment for a period not exceeding two months, or to such imprisonment without the option of a fine."

EXPLOSIVES.

Chapter IV.—" General and Miscellaneous "—contains a number of particularly important provisions. Section 19 prescribes "penalties in connection with the illegal use and possession of explosives." A distinction is made between an explosion " negligently" caused and one " wilfully" caused. For the former the maximum penalty is "a fine not exceeding £1,000, or, in default of payment, imprisonment for a period not exceeding two years or to such imprisonment without the option of a fine, or to both such fine and such imprisonment. Clause (d). sub-section (1). reads : " If the explosion be unlawfully and wilfully caused. he shall be liable, even though in fact property be not injured, or life be not endangered, or death do not result, to imprisonment with hard labour for a period not exceeding twelve years." Section (2) is also far-reaching, for it lays down that : " If any person uses an explosive for a purpose and in a manner not authorised by any licence, certificate, or permit held by him under the Explosives Act, 1911, or any amendment thereof, or any regulation made thereunder, he shall be deemed to have attempted to commit such an unlawful and wilful act as is described in sub-section (1) (d) unless he prove to the Court before which he is charged that he had no unlawful intent in so possessing or using the explosive." It is further provided that " nothing in this section contained shall be construed as exempting any person from being charged and punished under the common law or any other statute in respect of any act or omission described in this section" (relating to explosives).

DEPORTATION

The greatest amount of controversy is likely to be aroused by Section 21. which makes provision for deportation. That section reads : (1) Any person who, after the commencement of this Act. is convicted of any of the following crimes or offences : high treason. sedition. public violence, an offence against sub-section (1) (d) of section 19, or of any conspiracy or incitement to commit such crime or offence, and who by reason of the circumstances connected therewith is deemed by the Minister to be an undesirable inhabitant of the Union, shall, unless he is a person born in any part of South Africa which has been included in the Union, be liable to be dealt with in manner provided by section twenty-two of the Immigrants Regulation Act, 1913. (2) Any person who, before or after the commencement of this Act, has been convicted in any country, colony or territory, other than the Union, of any offence mentioned in sub-section (1) of this section, or of a similar offence, shall be deemed to be such a person as is mentioned in sub-section (1) (f) of section four of the said Immigrants Regulation Act.

SPECIAL CRIMINAL COURT.

The circumstances in which the Governor-General may constitute a special Criminal Court for the trial of persons charged under this law are thus defined : (1) Whenever an Attorney-General shall have determined, after an accused person has been committed for trial to indict him on a charge of (a) an offence against Chapter II. (" Protection of Workmen") or Chapter III. (" Riotous Gatherings and the dispersal thereof") of this Act : or (b) an offence mentioned in Section 21 (quoted above); or of an attempt, conspiracy or incitement to commit such an offence, and is of opinion that, if the accused person were tried by a jury, the ends of justice are likely to be defeated, he shall state in writing to the Minister such his opinion together with the offence for which he proposes to indict the accused (2) The Governor-General may thereupon constitute a special Criminal Court which shall have jurisdiction to try without a jury any charge which may be made in the indictment . . . A decision of the majority of such Court shall be the decision of the Court The special Criminal Court, it is prescribed shall consist of one Judge of the Supreme Court (who shall act as President of the Court) Advocate of not less than ten years' standing, and a Magistrate Several laws or portions of laws are repealed, including Law No 6 of 1894, of the Transvaal, on the right of public meetings, and several sections of the Indemnity and Peace Preservation Ordinances, 1902 of the Transvaal and Free State. Another stipulation enacts that " so much of the common law as renders illegal any gathering of persons in the open air without the consent of the authorities shall cease to be in operation in the Union."

REPORT OF THE ECONOMIC COMMISSION.

Summary of Conclusions—Abolition of "Colour Bar" and Recognition of Trade Unions Recommended—Wages and Cost of Living Compared—Rand Workers Best Paid in the World—How to Minimize Strikes.

The report of the Economic Commission was laid on the Table of the House of Assembly this week by the Minister of Mines (the Hon. F. S. Malan). The Commission, it will be remembered, included as its members Professor Sydney Chapman, Professor of Political Economy in the University of Manchester, who acted as Chairman, Mr. W. M. Evans, C.M.G., of Durban, Mr. P. Michau, of Cradock, Mr. Howard Pim, of Johannesburg, and Mr. W. Macintosh, of Port Elizabeth, with Mr. J. B. Moffatt (Director of Census) as Secretary. On the resignation of Mr. Macintosh, Mr. Ludwig Wiener, of Capetown, was appointed to be a member of the Commission. The terms of reference to the Commission were to enquire into and report upon the following matters: (1) Wages, working hours and the cost of living on the Witwatersrand and other industrial centres within the Union; (2) comparison between wages, working hours and cost of living at such places with those ruling in other countries; (3) cost of production in the Union compared with that of other countries; (4) the question of establishing a minimum or subsistance wage in any trades or industries within the Union; (5) the payment for overtime and for night-work in trades or industries within the Union.

WHAT THE REPORT DEALS WITH.

The Commission was appointed on September 11, 1913, and completed its sittings on January 17 of the present year. The report deals with the following subjects: The cost of living, wages, and conditions of white labour; wages and conditions of non-white labour; a legal minimum wage and allied questions; the system of arranging wages and conditions of labour and machinery for settling disputes; systems of paying wages; hours of labour and overtime.

In the eighth section of their report, the Commissioners give a summary of their conclusions and recommendations. In doing so, the Commissioners observe: "It is almost impossible to summarise satisfactorily the numerous conclusions at which your Commissioners have arrived, as many of them cannot be expressed shortly without altering their character. This being so, the digest beneath must be regarded as a brief and incomplete synopsis, drawn up mainly for purposes of reference. Such conclusions as take the form of recommendations to the Government are separately stated.

MAIN CONCLUSIONS.

"Your Commissioners' chief conclusions are as follow:—

(1) The cost of living for whites (food and rents) on the Witwatersrand is about 40 per cent. higher than in America (the most expensive of the other countries examined), and nearly 80 per cent higher than in any European country.

(2) The chief factor in the high cost of living in South Africa is rent, and another factor of some weight is the high standard of living, particularly on the Witwatersrand.

(3) Wages on the Witwatersrand are nearly 40 per cent. higher than in America (where money wages are materially greater than in any other country examined), and nearly 225 per cent. higher than in any European country.

(4) When allowance is made for cost of living as a whole, it would seem that the workman on the Witwatersrand is better off than the workman in America, and much better off than the workman in Europe.

PAY OF MINERS.

(5) Miners on the Witwatersrand earn more than any other workmen, but as they labour under so many disadvantages, their earnings are not unreasonably high.

THE RISING GENERATION.

(6) Few of the rising generation in South Africa are being apprenticed to the skilled trades, and the training given to apprentices is seldom satisfactory. Attention should be given to this matter, and particularly to the preparation of the youth of the country for supervisory positions, which are relatively numerous and highly remunerative in South Africa.

COMPLAINTS BY RAND NATIVES.

(7) Complaints on the part of the natives as regards wages on the Witwatersrand are common, and the system of the maximum average wage prevailing there is specially objected to.

(8) The productivity of the natives could be increased by giving more attention to the organisation of the work, and, where it is possible, adopting more generally the piece-rate system, particularly on the Witwatersrand gold mines.

WHITE ARTISANS HOLDING THEIR OWN.

(9) In the skilled trades the competition of natives and Indians is negligible, and the white skilled artisans do not appear to be losing ground as a result of the competition of coloured people.

(10) It is undesirable that barriers should be placed in the way of non-white labour by the State or local authorities to prevent the advancement to any kind of work of which non coloured workers are capable.

MINIMUM WAGE NOT DESIRABLE.

(11) It is not desirable that the Government should lay down a minimum subsistence wage, whether made applicable to whites alone or to all persons regardless of race; but, as many white persons are in receipt of low wages, some action of a less drastic character should be taken.

(12) It is not desirable that the Government, by direct action or through local wage boards, should decree either a general or local minimum standard rate for skilled and semi-skilled callings, whether made applicable to whites alone or to all persons, regardless of race.

(13) Agreements entered into voluntarily by employers and employed after consultation are more likely to bring about mutually satisfactory terms and conditions of employment than State action.

HOW TO ALLAY LABOUR UNREST.

(14) If satisfactory agreements are to be made, and the existing labour unrest is to be allayed, it is essential that employers should recognise trade unions.

(15) With a view to preventing strikes and lock-outs and settling disputes, voluntary conciliation boards should be established, and the additional provisions referred to in recommendation No. 4 below should be made.

(16) Strikes among white workmen have caused considerable unrest among natives.

(17) In most cases it is in the interest of the employers and employed that local standard rates of pay should be recognised and adhered to, and, if other than time rates, that they should provide for an adequate minimum wage, whether weekly or monthly.

CONTRACT SYSTEM ON THE RAND.

(18) The contract system on the Witwatersrand gold mines should be abandoned in favour of day's pay or a premium or bonus system.

(19) The hours of labour are excessive in not a few cases.

(20) When production is continuous throughout the 24 hours, three shifts should be worked, if possible, and, if not, longer intervals should be introduced into the two shifts than is usual to-day. A night shift should normally be shorter than a day shift, and no men should be kept on night shift for more than a limited period.

(21) The principle of one day's rest in seven should be recognised

(22) Overtime should be discouraged, and, when unavoidable, should be paid for at a higher rate than ordinary day's pay. Work on a seventh day in any week should be regarded as overtime.

COST OF LIVING.

An important table on the cost of living shows the relation of the cost in various centres to that at Johannesburg, the Johannesburg cost of living being represented by the index number 100. The table is as follows, average of 18 articles:—Capetown, 89; Aliwal North, 93; Beaufort West, 95; Cradock, 87; East London, 98; Graaff-Reinet, 84; Grahamstown, 88; Kimberley, 102; Kingwilliamstown, 90; Mossel Bay, 89; Oudtshoorn, 94; Port Elizabeth, 87; Queenstown, 92; Uitenhage, 90; Durban, 86; Maritzburg, 89; Johannesburg, 100; Pretoria, 100; Pietersburg, 92; Bloemfontein, 90; Jagersfontein, 103; Kroonstad, 107.

The 18 articles taken are: Beef, mutton, tea, coffee, cocoa, sugar, bacon, eggs, cheese, potatoes, flour, butter, bread, fresh milk, tinned milk, oatmeal, rice and paraffin.

A further table of great importance may be quoted from the report, showing the cost of working-class living (food and rents) on the basis of Johannesburg representing the index number 100:—

Witwatersrand, 100; South Africa, 87; United Kingdom, 49; France, 54; Germany, 56; Belgium, 45; U.S.A., 71; Canada, 70; Australia, 61; New Zealand, 57.

RENTS AND WAGES.

The Commission observes that rents for white working-class dwellings are high throughout the country, and correspond to about half the family expenditure on food. In the opinion of the Commission, a leading cause of high rents is the division of the South African community into two distinct racial strata, with widely differing standards of living and purchasing power.

In the section relating to wages, the following table, giving index numbers of wages of skilled artisans per hour may be quoted: South Africa, 77; Johannesburg, 100; England, 28; France, 18; Germany, 21; Belgium, 15; U.S.A., 69; Canada, 67; Australia, 60.

TABLE SHOWING REAL WAGES.

A further table gives index numbers of real wages (i.e., wages in relation to the cost of living) in South Africa and other countries, with Johannesburg as the base at 100.

Johannesburg,	100-110.
South Africa,	92-100.
United Kingdom,	63.
France,	43
Germany,	46.
Belgium,	44.
United State of America,	101
Canada,	100.
Australia,	98.
New Zealand,	102.

The last three figures are stated to be of doubtful value.

COMPETITION WITH COLOURED LABOUR.

Reviewing the whole situation as regards the competition of white and non-white in the skilled and semi-skilled callings, the Commissioners conclude as follows :—

The competition is greatest with the Cape coloured, and next in magnitude with the Indians. None of the evidence proved that the sphere of white labour was being absolutely restricted in the Union, and the wages of the whites, have not fallen. It is a plausible view that some of the so-called encroachments of the non-whites should properly be regarded as a filling of the gaps left by the attraction of the whites to superior situations could not have existed in the absence of competent people to fill the lower positions. Several witnesses affirmed that there was a dearth of capable white labour, and that a good man soon found a better opening for his talents. The complaints of grinding competition can be understood, since anybody who experiences competition feels it, even if his rivals are losing ground; but here and there white labour may have been displaced, and a constant fear of displacement is prevalent, which is comprehensible, particularly as the non-white workman usually gets a lower wage. The low wage of the non-white, combined with the fact that he readily drops his supply price when demand slackens, is apt to cause a substitution of non-white for white labour when business is depressed.

WHITES PRE-EMINENT IN INITIATIVE.

Finally, your Commissioners conclude that in initiative, resource, and powers of control the white races unquestionably stand pre-eminent. It is important that the rising generation of the whites should fit themselves to fill supervisory and highly-skilled positions, so that such competition as may be felt in the future may force them upwards rather than downwards. The State and local authorities can assist the movement in the right direction by providing educational facilities. With reference to industrial needs, success cannot be achieved by the white man in South Africa by keeping the coloured man down, but by his raising himself up.

RECOMMENDATIONS.

Your Commissioners recommend that periodical enquiries should be made by the Statistical Office into :—

(1) Cost of living in different parts of the Union.

(2) That a non-political Advisory Council to deal with native questions should be instituted.

(3) That an Industrial Commission should be appointed (a) to administer any laws that may be passed relating to trade unions and industrial disputes, and (b) to deal with the problem of low wages.

(4) That an Act should be passed facilitating the formation of conciliation boards, providing for mediation, and in the last resort, if deemed expedient, for reports on strikes or lockouts by disputes boards or otherwise.

(5) That an Act should be passed providing for voluntary registration of trade unions and the protection of non-uninoists.

(6) That on and before Conciliation Boards and representative Disputes Boards, officials of registered trade unions should be given a status.

(7) That a Factory Act should be passed regulating the hours and conditions of labour.

(8) That the regulations relating to hours in shops should be assimilated to the most comprehensive at present in force.

(9) That by legislative enactment one day's rest in seven should be required for all industrial workers.

(10 That whenever the hours are regulated, payment for overtime at the rate of time-and-a-quarter at least should be required.

(11) That periodical industrial reports should be made.

(12) That the administration of all industrial and mining legislation should be centralised in one office.

THE COST OF SOUTH AFRICAN COMMISSIONS.

Interesting Figures Reflecting the State Expenditure on Recent Enquiries.

The following is a return of the cost of Commissions (exclusive of those relating to the Railways and Harbours Administration) appointed by the Government during the period May 31, 1910, to February 16, 1914 :—Commerce and Industries (completed): Sir T. M. Cullinan, Kt., M.L.A. (chairman), (out-of-pocket expenses), £119 14s.; Wm. Macintosh, £285 12s.; W. A. Martin, £412 13s.; J. Mossop, £403 4s.; C. G. Smith, £324 9s.; Hon. J. G. Maydon, £25 4s.; Senator the Hon. A. G. Viljoen, M.D. (expenses), £315 12s. 9d.; Hon. C. H. Wessels, £374 17s.; total, £2,261 5s. 9d. Public Service Reorganisation (completed): H. C. Campbell, I.S.O. (chairman), £1,074 3s.; Sir A. Stockenstroom, Bart., M.L.A., appointed 18/9/11, *vice* H. C. Campbell (resigned), (out-of-pocket expenses), £8; C. J. Bird, C.M.G., appointed 18/9/11, *vice* A. Brown, C.M.G., I.S.O. (resigned), £475 13s.; A. Browne, C.M.G., I.S.O., £1,108 16s.; A. B. Hofmeyr (salary), £999 9s. 3d.; total, £3,666 0s. 3d. Coal Dust Committee (completed): U. P. Swinburne, Inspector of Mines (chairman); W. Wybergh, £116 11s.; W. T. Heslop, M.I.M.E., F.G.S., £80 6s. 6d.; total, £196 17s. 6d. East Rand Proprietary Mines Inquiry Commission (withdrawn 6/10/11): H. O. Buckle, Chief Magistrate, Witwatersrand (chairman); P. R. Frames, £6 6s.; R. N. Kotze, Government Mining Engineer; total, £6 6s. Financial Relations (completed): Right Hon. Sir G. H. Murray, P.C., G.C.B., I.S.O. (chairman), £1,420 16s. 11d.; Hon. Sir P. M. Laurence, K.C.M.G., LL.D.; Sir Thomas Hyslop, Kt., £431 11s.; P. Duncan, C.M.G., M.L.A. (expenses), £9 10s. 5d.; Hon. C. H. Wessels, £248 17s.; total, £2,110 15s. 4d. Miners' Phthisis (completed): S. V. van Niekerk, M.B., Ch.B., Mines Medical Inspector (chairman); E. P. Baumann, M.D., Ch.B., M.R.C.P., M.R.C.S., L.R.C.P., £258 6s.; R. L. Daly, F.R.C.S., M.D., B.S., £274 1s.; L. G. Irvine, M.A., M.D., C.M., B.Sc., £144 18s.; G. D. Maynard, F.R.C.S., M.R.C.S., L.R.C.P. (salary as secretary, £50 per month), £600; T. C. Visser, M.D., B.S., £274 1s.; A. H. Watt, F.R.C.S., M.B., C.M., £151 4s.; total, £1,702 10s. Sunday Observance (completed): H. J. Hofmeyr (chairman), £396 18s.; Hon. F. T. Angus, £378; R. H. Lundie, £315; W. Wybergh, £223 13s.; G. A. Kolbe, £296 2s.; A. Wagner, £94 10s.; total, £1,704 3s. Tuberculosis and Pneumonia (in progress): A. J. Gregory, M.D., M.R.C.S., L.S.A., D.Ph. (chairman), £2,424 9s.; Hon. R. Jameson, £800 2s.; the Hon. Thos. te Water, M.D., M.Ch., £1,740 18s.; Chas. Porter, M.D., B.Ch., B.A.O., M.R.C.S., D.Ph., LL.B., £643 13s.; G. A. Turner, M.B., B.Ch., D.Ph., £723 19s. 6d.; total, £6,333 1s. 6d. Assaults on Women (completed): Melius de Villiers, LL.B. (chairman), £454 2s. 6d.; Hon. Sir T. K. Murray, K.C.M.G., £414 4s. 6d.; Sir J. J. Graham, K.C.M.G., £412 13s.; General the Hon. C. R. de Wet, £126; P. R. Frames, £236 15s. 6d.; Mrs. S. A. Woods, £464 2s.; Mrs. A. Faure, £456 15s.; Mrs. M. E. Fuller, £396 18s.; total, £2,961 10s. 6d. Miners' Small Holdings (completed): H. C. Fleischer, registrar of mining titles (chairman); R. Feetham, £88 4s.; F. A. W. Lucas, £103 19s.; W. S. Scott, £91 7s.; J. J. du P. van Niekerk, £103 19s.; total, £387 9s. Economic (completed): Prof. S. J. Chapman (chairman), £402 17s.; M. S. Evans, C.M.G., £278 15s. 6d.; Wm. Macintosh (resigned); P. W. Michau, £264 12s.; H. Pim, C.A., £285 1s. 6d.; L. Wiener, appointed 30/9/13, *vice* Wm. Macintosh (resigned), £248 17s.; total, £1,480 3s. Native Land (in progress): Hon. Sir W. H. Beaumont, Kt. (chairman), £269 11s. 6d.; General Schalk Wm. Burger, M.P.C., £81 18s.; Wm. R. Collins, £16 14s.; Senator Col. the Hon. W. E. M. Stanford, C.B., C.M.G.; Hon. C. H. Wessels, £74 11s.; total, £472 14s. 6d.

Transvaal G.M. Estates.

The secretaries write, under date 28th February, 1914: "The London office of this company cables that the *Financial Times* publishes a cable from Johannesburg stating that a disconcerting report is in circulation regarding Duke's Hill Channel. The following cable has been despatched to London to-day:—No foundation for rumour regarding Duke's Hill. Information quarterly report just issued still holds good. Duke's Hill continues to develop highly payable values. Development in Peach Tree still unpayable. Position of Theta, Graskop, Brownshill unchanged. Ore reserves Central Mines at 31st December compared with 1st April estimated decrease 5,000 tons, increase average value 1·3 dwts. per ton. Labour supply improving and scale of development increasing. Elandsdrift, Vaalhoek, reserves position improved, the latter materially so. Publish."

Rhodesian Section.

LATEST MINING NEWS.

The January Output—The Jumbo-Shamva's Trial Run—Tati Concessions—Cam and Motor Empress Mines—Rhodesia, Ltd.—Wankie Colliery.

THE total value of Southern Rhodesia's mineral output for the month of January. full details of which are published on other pages of this issue. has been officially declared at £282.860—an increase of £12.320 when compared with the month of December. The figures for the two months read as under:—

December.		January.	
Gold...	£254,687	Gold	£249,031
Silver	1,191	Silver	1.069
Lead	371	Lead	349
Chrome Iron	5,175	Chrome Iron	21,281
Coal (Sales)	8.905	Coal (Sales)	9,882
Asbestos	—	Asbestos.	1,060
Diamonds	211	Diamonds	188
Total...	£270,594	Total...	£282,860

These figures show that while the production of silver, lead. and diamonds was substantially the same, and that of chrome iron and coal a satisfactory improvement. the production of gold during the first month of the year was disappointingly under expectations. On the other hand it is pleasant once again to have to record an output of asbestos and it is to be hoped. with the railway now within measurable distance of the deposits being worked, that this mineral will from this time forward figure regularly in the list of production. The drop in the gold returns—1.341 ozs. in weight and £5.656 in value—is not to be accounted for by the closing down of any particular property or properties, for all of the larger among the regular producers sent in a return, but by slightly decreased figures scattered throughout the whole list. In many cases no doubt the position was affected to some degree by water shortage, a difficulty that the copious and general rains of the last few weeks will have put an end to.

* * * *

A table, showing the value of the monthly and annual gold outputs, together with the value of the other minerals recovered, is appended:—

Month.	1912.	1913.	1914.
January	£214,918	£220,776	£249,031
February	209,744	208,744	
March	215.102	257,797	
April	221,476	241,098	
May	234.408	243,452	
June	226,867	240,303	
July ...	240,514	249.302	
August	239,077	250,576	
September	230.573	250,429	
October ...	230,072	247,068	
November	225,957	239,036	
December	218.661	254,687	
Total Gold	£2.707.369	£2,903.268	£249,031
Other Minerals	259,568	253,674	33,829
Total value	£2,966.947	£3.156.942	£282.860

* * * *

In further reference to the text of the cable published last week, it appears that a supplementing message, dated the 28th ulto., was dispatched from the Jumbo Mine to London This read: " Refer to our telegram of 23rd; average value on east side assays 6¼ dwts. over 6ft.; on west side assays 8½ dwts. over 6 ft.; reef is not yet well defined."

The following is the text of a cablegram dispatched from the Shamva Mine to the London office on the 28th ulto.: " Trial run started last night—H. A. Piper." There is no official information as yet as to when the trial runs—it is understood that the various units are being started in sections—will end and regular crushings begin, but we learn that operations, as far as conducted, are giving complete satisfaction.

* * * *

The adjourned ordinary general meeting of shareholders in Tati Concessions, Limited, was held on the 30th ulto., at the Cannon Street Hotel, E.C., Mr. C. V. Thomas presiding, when a resolution was adopted nem. con., ratifying the appointment of a Committee to confer with the Board as to the details of a scheme of reconstruction or other financial scheme to be laid before the general body of shareholders, and adjourning the meeting until a date to be fixed within the next three weeks by the Directors in consultation with the Committee.

* * * *

The following is taken from an article on the Cam and Motor appearing in " The Times," by Rowland C. Fielding: " The prospect of an enlargement of the mill seems to be favourable, but this must of course depend upon the results met with upon deeper development of the ore body, and presupposes that the process which has been installed will prove commercially suitable. Speaking of the latter question, there are dangers ahead which it would be foolish to minimise. The " sintering " difficulty has already been alluded to, but there are other possibilities—for example, that gold may be lost through volatilization during the process of roasting, or that soluble compounds may be formed which will affect the gold extraction. These difficulties and others as they are or are not successfuly overcome will no doubt be reflected in the market price of the shares, the fluctuations in which since the plant has neared completion having suggested that already the minds of some people are not free from agitation."

* * * *

An extraordinary general meeting of the Empress (Rhodesia) Mines, Limited (in liquidation) was held at the Company's office, Salisbury House, E.C., on Tuesday in mail week, for the purpose of having laid before it the account of the liquidator (Mr. R. F. Masterton), showing the manner in which the winding-up had been conducted, and the property of the company disposed of.

* * * *

The following are the official details of development work on Rhodesia. Ltd.'s property, the Sabiwa, during the month of December:—114 ft. of development were executed altogether. On the Kopje section, the 4th level drive south was extended 41 ft. during the month, making a total of 278 ft. No reef was exposed during December. On cross-cut No. 6, 9 ft. of reef were exposed, the average assay value being 16 dwts.

* * * *

In connection with the supply of coal and coke for the copper-smelting works at Lubumbashi it is said that the Union Miniere du Haut Katanga is endeavouring to acquire a large holding in Wankie Colliery. The report (says the " Financial News ") is that a deal is being negotiated between the Union Miniere and a London finance company which has a big interest in the colliery company. " As usual, it is a question of terms, and it is believed that the would-be purchasers will increase their bid."

THE JANUARY OUTPUT.

Gold Output Lower—All Minerals Show Increase.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of January, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Abercorn (W. J. Lane)	2	235	106.47	447
Do. (sands)	—	160	23.42	98
Agincourt (H. L. Maidwell)	5 1P	167	124.80	524
Antelope G.M. (Rhod.), Ltd.	10P 2BM	2717	1398.06	5872
Asherie (Triggs and Huntley)	5	236	157.32	661
Atlas (Est. R. Barkley deceased)	10	780	102.17	429
Do. (sands)	—	510	56.48	237
Bembesi (Rosevear and Nankervis)	—	—	11.31	47
Big Ben (W. E. Hunt)	2	186	77.96	327
Do. (sands)	—	132	40.53	170
Blanket (Forbes Rhod. Synd., Ltd.)	15	980	143.10	601
Blue (J. Eisenhammer)	2	180	45.23	190
Bobs (Bobs Reef Syndicate)	5	270	50.90	214
Burton (S. H. Burns) sands	—	800	53.22	223
Bushtick Mines, Ltd.	28 3T	6449	172.15	723
Do. (sands)	—	3775	538.99	2264
Do. (slimes)	—	2577	285.79	1200
"C" (D. and C. Synd.)	10 1C	1195	47.06	198
Do. (sands)	—	998	116.00	487
Do. (slimes)	—	197	46.05	193
Carry (S. and G. Syndicate)	1 H	120	244.15	1025
Champion H (R. Aserman)	5	510	19.43	82
Do. (sands)	—	275	34.14	143
Chromate (A. Adams)	7	290	19.42	82
Claremont (B. L. Whyte)	7	800	117.20	492
Colleen Bawn (Colleen Bawn Syndicate, Limited)	6 2P	770	58.89	247
Do. (sands)	—	475	55.92	235
Do. (slimes)	—	543	105.37	443
Concordia (W. Reid)	(5)	175	20.76	87
Cottage (Cranleigh Syndicate)	2	112	25.69	108
Do. (sands)	—	50	11.80	50
Criterion Gold Mines, Ltd.	10	1295	491.33	2063
Do. (sands)	—	798	84.68	356
Cumberland (H. W. Bearcroft)	5	100	61.82	259
Discord (W. Reid)	5	365	41.51	174
Eagle A (Macdonald and Co.)	10	1181	186.32	783
Elumba A (Cooper and Bosomworth)	5	650	196 07	823
Do. (sands)	—	375	117.10	492
Enza (Lees and Curtis)	2	70	62.37	262
Euphorbia (D.W.K. Syndicate)	1 H	60	12.32	52
Farvic (H. S. Henderson)	5	537	240.19	1009
Do. (sands)	—	370	32.09	153
Flora (E. E. Beecroft)	5	250	128.31	539
Fred (Trans. & Rhod., Est., Ltd.)	10 2P	1587	803.10	3373
Do. (sands)	—	1587	302.12	1269
Godwin B (Barrett and Stacey)	5	145	298.16	1252
Golden Butterfly (Wheeler, Davis & Rintoul)	5	503	236.08	991
Imani (E. Rochfort)	2	182	110.80	465
Intabanenda (Est. B. Smaillie dcd.)	5	321	62.99	265
Do. (sands)	—	215	23.29	98
Jumpers (J. P. McCay)	5	450	281.50	1182
Do. (sands)	—	270	73.16	307
Kameel (New Rhod. M., Ltd., and A. M. Rhodes)	5	575	197.52	830
L (J. A. Warwick)	5	266	56.26	236
Do. (sands)	—	—	73.75	310
Li Hang Chang (G. Leach)	3	67	6.45	27
Little Beauty (T. A. Matthews)	3	30	27.23	114
Lone Hand (Armstrong, Furber, and Alexander)	5	441	121.79	512
Do. (sands)	—	301	56.61	238
Lonely Reef G.M. Co., Ltd.	20 3T	5970	1485.88	6211
Do. (slimes)	—	5970	3009.24	1263
Long John (Susanna Mines, Ltd. & B.E. Co., Ltd.)	8	1047	216.85	911
Do. (sands)	—	509	128.98	542
Do. (slimes)	—	129	44.35	186
Manxman (Manx Syndicate)	4	216	116.66	490
Mary and Alice (R. Dodman)	3	28	15.79	66
Master Cecil (Master Cecil Syndicate)	3	32	11.19	47
Matabele Queen's Co., Ltd.	10	1810	346.76	1456
Do. (sands)	—	1810	435.44	1829
Do. (slimes)	—	700	87.15	366
Mohen (C. Brunton) other sources	—	—	7.65	32
Morven (C. Brunton) other sources	—	—	4.09	17
M'Takati (R. Aserman)	2	141	46.81	197
Nelly (F. D. Roscoe)	3H	958	447.13	1878
Do. (sands)	—	745	155.97	655
New Eclipse (J. R. Stewart)	5	956	152.41	640
Do. (sands)	—	260	29.63	124
Old Caledonia (J. Parkhurst)	3	22	11.81	50
Old Nic (Chart. and General E. and F. Co., Ltd.)	15 4P	2021	607.05	2549
Do. (sands)	—	1094	181.82	764
Peach A (C. Salomon)	5	170	253.97	1067
Penzance (Penzance Trib. Synd.)	2	144	50.21	211
Do. (sands)	—	273	34.35	144
Poort (L. Zotta)	2	200	13.73	58
Polka (W. H. Robinson)	2	86	12.78	54
Do. (sands)	—	210	11.13	47
Princess 2 (C. A. Abbott)	2	307	44.25	186
Riversdale (C. Brunton) sands	—	1015	50.74	213
Riverside (R. Martindale)	2	80	28.28	119
Do. (sands)	—	42	4.99	21
Roan (J. Robinson)	2	290	46.31	194
Rous 1 (A. G. Hadingham)	2	131	88.07	370
Star (Star of Rhodesia, Ltd.)	5	116	44.66	188
Do. (sands)	—	310	59.85	251
Teutonic (Macdonald and Bonshor)	5	650	260.95	1096
Do. (sands)	—	600	51.54	205
Tuff Nut (King's Syndicate)	5	460	184.01	773
Do. (sands)	—	300	18.27	27
Do. (slimes)	—	703	47.96	201
Umviga (Cumings and Berry)	3	297	124.31	522
Umvoti (Henderson and Toshack)	5	131	89.67	377
Do. (sands)	—	131	34.47	145
Walk Over (A. W. Wilson)	5	146	40.55	170
Do. (slags)	—	—	2.18	9
Winifred (Exchange Synd.)	1 I.R.	106	49.49	207
Do. (sands)	—	70	31.65	133
Worthless (Forward (R) G.M., Ltd.)	4	105	7.65	32
Bulawayo District Total			17923.29	75264
Gwelo District—				
Ardpatrick (C. Maleham)	3	370	139.36	585
Alderman (Williams and Woodger)	3	250	75.73	318
Arizona No. 2S (L. R. Evans)	2	60	32.53	137
Bedad (A and B Syndicate)	15	1460	255.55	1073
Cactus I (Renton and Gray)	5	400	82.33	346
Do. (sands)	—	360	60.31	253
Collingwood (Pini and Wearing) Ball Mill	(4 GR)	1203	128.40	539
Csardas (Wolfshall Syndicate)	10	502	547.72	2301
Do. (sands)	—	390	48.59	204
Do. (slimes)	—	112	8.67	36
Eileen (M. L. Price)	5	500	73.34	308
Elysion (Holmes and Urquhart)	5	560	56.52	237
Fenella (J. Kinrade)	5	22	13.86	58
Gaika G.M. Co., Ltd.	5 1C	3079	1728.85	7261
Do. (sands)	—	1518	78.80	331
Do. (slimes)	—	1253	97.38	409
Glen Dora No. I (H. G. Mackintosh)	2	122	68.83	289
Globe and Phoenix G.M. Co., Ltd.	40 10P	6305	7399.90	31080
Do. (concentrates)	—	265	543.78	2289
Do. (slimes)	—	2429	638.82	2683
Gothic Mashonaland Agency, Ltd.)	15 2P	1450	345.24	1464
Do. (slimes)	—	272	29.43	125
Ingondomo (F. C. Luxat)	2&1H	540	90.72	381
Do. (sands)	—	380	33.27	140
Invulnerable (W. H. Steele)	5	75	13.77	58
Kaka Main (I. Maleham)	5	415	71.71	301
Kings (Phil S. Warden)	5	500	131.01	550
Do. (sands)	—	385	119.93	504
Maise Luck (J. Jones)	6	210	64.48	271
Moonie River (Yellow Jacket Synd.)	5	270	75.60	318
Multum (W. Cock)	3	72	17.77	75
New Dunraven G.M., Ltd.	5	820	84.63	355
Do. (sands)	—	900	39.20	165
North Bonsor (Cornish Syndicate)	20	2570	277.81	1167
Do. (sands)	—	1470	98.86	416
Paradox (Bolt & Franks)	5	250	75.33	316
Pompei (F. Brorson)	2	250	77.50	325
Redhill Dev. Synd., Ltd.	1C	3000	74.59	313
Do. (sands)	—	1058	69.31	291
Rose of Sharon (Crampin & Masters)	10	802	84.75	356
Do. (sands)	—	300	21.34	90
Snowed Up 1 S.E. (James & Morrisby)	5	683	252.11	1059
Stranger (J. M. Havnar) sands	—	380	49.33	207
Surprise (B. & P. Syndicate)	10	456	65.31	274
Tango (G. B. Havnar)	5	60	22.93	96
Tebekwe 1 (A. N. Tyrrell)	5	368	137.61	578
Tebekwe B 80b, do.	10	397	97.00	407
Tebekwe B 2735a (H. C. Baker)	10	289	31.50	132
Wanderer (Selukwe) G.M., Ltd.	4GR	11904	1520.03	6384
Gwelo District Total			16151.44	67855
Matabeleland Total		34,074.73ozs.		
Value		£143,119		

MASHONALAND.

	No. of Stamps	Tons Treated.	Yield. ozs.	Value. £
HARTLEY DISTRICT—				
Abracadabra (P. O. J. Fry) Pannings	—	—	8.12	34
Acorn Gold Mines, Ltd.	5	517	89.05	374
Do. (sands)	—	300	49.84	209
Agnes (P. S. Triggs)	5	515	292.19	1227
Do. (sands)	—	364	24.08	101
Alabama (Rix & Richards) clean up	3	45	36.41	153
Do. (Alabama Synd.)	—	62	41.19	173
Amaroso (C. H Wheildon)	—	—	6.65	28
August (Arthur & Quinn)	(2)	97	20.74	87
Baltimore & Virginia (P. A Enke)	1Pn	450	63.28	266
Battlefields (Rhodesia), Ltd. (O.S.) (Minnaar & McArthur) .. .	—	—	2.02	8
Blue Rock (Blue Rock Synd.)	2	120	27.53	116
Brilliant (Mabel's Luck Synd.) ..	7 1P	1000	386.41	1623
Do. (sands)	—	338	46.95	195
Buller (J. Laing) slimes	—	300	44.83	188
Chadshunt (C. H. Wheildon) (sands)	—	44	17.09	72
Cheshire Cat (Arnold & Windley)	5 1P	420	164.39	691
Do. (sands)	—	220		
Do. (slimes)	—	130		
. .. .			38.42	161
Concession and W. Extension (C E. Simpson) .. .	5 1C 2P	2601	431.18	1811
Do. (sands)	—	1980	122.06	513
Cuba (Est. C. C. Hendrie)	—	—	2.47	10
Dalny (Macdonald & Sale) . ..	5	812	53.55	225
Do. (sands)	—	485	126.12	530
Do (slimes) .	—	320		
Dalny 1 (Macdonald & Sale) .	5	572	58.17	244
Do. (sands)	—	286	67.54	284
Eiffel Blue and E. Ext. (Willoughbys)	10	1468	583.51	2451
Do. (sands)	—	770	47.14	198
Eileen Alannah Mining Co., Ltd.	10	1738	1029.67	4325
Enny Ext. (Ellsmoor & Goodyer) ..	5	378	263.26	1106
Do. (sands)	—	528	59.96	252
Giant Mines of Rhodesia, Ltd.	30 2T	10723	2087.46	8854
Glasgow Mines, Ltd.	5	552	251.75	1057
Do. (sands)	—	210	36.97	155
Glencairn No. 3 (Glenrosa Synd.) ..	4	368	235.09	987
Do. (sands)	—	207	16.37	69
Golden Valley (J. Mack) . . .	10	1048	686.97	2885
Do. (sands)	—	560	137.70	578
Grand 2 (Sun Synd.) sands ...	—	220	16.71	70
Hepworth No. 1 (L. Heilman) .	2	185	36.34	153
Hero 2 (Storey and Steele) .	1H	205	52.32	229
Inez (Harill and Smith) . .	10	475	163.01	685
Do. (sands)	—	350	39.44	166
Jessie Palmer (Crown Synd.) . . .	2	70	25.30	106
Johnnie's Folly (G. R. Laws) (sands)	—	29	16.31	68
Juno (H R Nicholl) .	5	710	91 65	385
Do. (sands)	—	390	39.61	166
Kanyemba (Kanyemba Synd.) .	5	375	250.50	1052
Do. (sands)	—	200	31.13	131
Mali (McAdams and Purves)	2	50	7.85	33
Midwinter (Midwinter Syndicate)	4	378	81.97	344
Do. (sands)	—	297	33.58	141
Moliere (H Moser)	5	670	95.08	399
Owl (A. Rolfe)	10	1334	477.56	2006
Do. (sands)	—	1100	198.98	836
Do. (slimes)	—	240		
Pickstone Gold Mines, Ltd.	10 1C	4479	618.34	2597
Do. (sands)	—	1310	238.74	1003
Do. (slimes) .	—	1260	59.67	251
Pomposo (J Knott)	4	360	166.15	698
Rosaline A (J. F. Meade)	5	185	38.92	163
Rover (S. H Coker)	2	60	35.90	151
Do. (sands)	—	416	54.60	229
Seigneury (Seigneury Syndicate)	5	412	175.11	735
Do. (sands)	—	300	22.77	96
Shepherds (Phoenician (Rhodesia) Co., Ltd.)	5 1T	1017	267.63	1124
Do. (sands) .	—	1017	163.88	688
Sid (Sebakwe & District Mines, Ltd.)	5	610	139.81	587
Do. (sands)	—	519	43.45	182
Staffordshire Knot (F Sheldon)	5	30	11.16	47
Tea (Cent. Min. and Invest. Corpor., Ltd. Homan Syndicate, Ltd. (other sources)	—	—	5.92	25
Thistle Etna G.M., Ltd	1C	2901	803.66	3376
Do (sands)	—	1881	191.03	802
Do (slimes)	—	493	50.27	211
Tia 5 (A Schell)	(5)	60	12.49	52
Do. (sands)	—	30	3.87	16
Trinidad 1 (T McDowell)	2	420	69.97	294
Do. (sands)	—	220	30.20	127
Try Me 2 (R. R. Aitken)	5	350	104.29	438
Washington (I. J. Minnaar)	5	512	301.42	1266
Do. (sands)	—	450	30.99	130
Hartley District Total			12953.71	54489
Ayrshire (J. E. Parker) sluicing	—	982	92.97	390
Eldorado Banket G.M. Co., Ltd	20 2C 8P	4644	1638.61	6949
Do. (sands) .	—	5330	708.12	3003
Linnett (A. L. R. Morkel)	2	840	174.81	734
Lone Hill (F. B Platt) .	2	90	20.66	87
Mediteraneo (Perhat and Baburizza)	2	120	86.62	364
Medway (Stone and Standen)	5	155	26.15	110
Lomagundi District Total			2747.94	11637
MAZOE DISTRICT.—				
Alice (Rhod. G.M. & I. Co., Ltd.)	—	—	19.42	82
Botha H (Cunningham & Allison) sands	—	250	33.23	140
Glandore (Harries and Cooke)	2	250	150.47	632
Goth B (Goth Syndicate)	2	100	23.31	106
Honest (G. Brown)	—	100	25.31	106
Jumbo G.M. Co., Ltd.	30	3400	788.23	3350
Do. (sands)	—	2240	190.36	809
Do. (slimes)	—	1160	71.08	302
Kimberley (Mash) G.M. Co., Ltd.	6 2T	3500	783.63	3327
Do. (sands)	—	1500	315.01	1329
Do. (slimes)	—	2000	174.04	734
Micky (Micky Syndicate)	2	249	62.57	263
Mitre 8 (Bishop's Syndicate)	1D	24	18.55	78
Oceola G.M. Co., Ltd.	5	550	228.27	959
Do. (sands)	—	300	13.90	58
Ravine (H. O. Coker)	2	307	82.43	346
Rosehearty 1 (Rosehearty Synd.) pannings	—	—	1.83	8
Umkulu DB 1W (Head & Mason) ...	2	325	83.67	351
Do. (sands)	—	600	27.46	115
Venus (Giles & Southey)	2	227	70.22	295
Xmas (D. Pearce)	2	225	49.17	207
Mazoe District Total			3212.28	13589
SALISBURY DISTRICT.—				
Arcturus (L. Chiappini) sands	—	500	71.75	301
Banker (Dyason andl Wells)	3	16	4.33	18
Cross-Your-Luck (S. T. L. Synd.)	2	152	85.16	328
Inyague 3 (Hodge & Von Hagan) ...	2	122	34.56	145
D. (M. Friend) (sands)	—	250	18.07	76
Joker (Manduza Syndicate)	121	2	141.42	594
Louise Grand (H. S. Plant)	1H	1100	121.92	512
Do. (sands)	—	600	45.50	191
Mont d'Or (Claxton and Bussell) ...	2	101	104.48	439
New Full Back G.M. Synd., Ltd. ...	2	120	33.44	140
Old Loyalty (Shamva Hex G.M. Co., Ltd.	5	378	270.76	1137
Olympus C (D. Peridis)	1H	225	73.96	311
Salisbury District Total			1005.35	4192
UMTALI DISTRICT.—				
Champion (J. Buchanan)	5	840	78.80	31
Do. (sands)	—	486	92.49	388
Do. (slimes)	—	354		
Kent (E. Evans)	5	590	525.15	2206
Do. (sands)	—	1000	82.76	347
King's Daughter D.B. (Umtali Waterfall Syndicate) slimes ...	—	1021	141.21	593
Liverpool 3S (R. G. Snodgrass)	5	760	128.95	542
Do. (sands)	—	240	49.41	208
Montezuma 2 (Montezuma G.M. Co.) Ltd.)	5	80	14.67	62
Do. (sands)	--	180	41.22	173
Pilgrim T E (J. Meikle)	5	400	134.85	566
Quagga (Quagga Syndicate) ..	5	375	120.51	506
Do. (sands)	—	1000	53.76	226
Rezende Mines, Ltd.	110	18600	1857.01	7879
Do. (concentrates)	—	146	537.63	2252
Do. (sands)	—	2875	271.36	1151
Do. (slimes)	—	972	91.36	388
Surrey (Keir and Rooke) .	5	530	294.67	1238
Two Sisters (F. E. Markham)	2	62	23.57	99
Umtali C (Umtali Waterfall Synd.)	(10)	104	20.99	88
Umtali D do.	10	428	169.64	712
Do. (sands)	—	341	60.37	254
Do. (slimes)	—	253		
Una (G. W. Randall) ...	3	120	12.01	50
Umtali District Total			4802.30	20259
VICTORIA DISTRICT.—				
Texas (G. Scott)	10	1150	306.72	1288
Do. (sands) ... . . . , .	—	700	109.05	458
Victoria District Total .			415.77	1746
MASHONALAND TOTAL			25,137.44ozs.	
VALUE			£105,912	
GRAND TOTAL GOLD OUTPUT			59,212.17ozs.	
VALUE			£249,031	

SUMMARY.

Matabeleland . .	34,074.73	£143,119
Mashonaland	25,137.44	105,912
Total	59,212.17	£249,031
Silver (ozs.)	10,657.82	1,069
Lead (tons) ...	20.07	349
Chrome Iron (tons)	9,533.80	21,281
Asbestos (tons) .. .	58.84	1,060
Diamonds (carats)	66.00	188
Coal (tons)	28,014.00 (Sales)	9,882
TOTAL FOR JANUARY OUTPUT		£282,806

EAST RAND PROPRIETARY MINES' POSITION AND PROSPECTS.

Points from Annual Reports.—Reduced Working Costs Offset Decline in Grade.—Restricted Development Operations.—Labour Shortage Hampers Development and may affect this Year's Profits.

The Superintending Engineer's report on the E.R.P.M. in 1913 has the following, *inter alia*:—After making due allowance for the general strike of July last, and its unsettling effects not only on the white but native employees, the results obtained during the year many be accepted as satisfactory. The recovery value obtained from the treatment of current ore amounted to 30s. 9d. per ton milled as against 32s. 1d. per ton milled in the previous year, a decrease of 1s. 4d. per ton. The recovery more closely approximated to the average value of the ore reserve. Although the value recovered shows a decrease of 1s. 4d. per ton, the profit is only 4d. per ton lower than that of 1912, a result which has been obtained by a reduction of 1s. per ton in the working costs, which for the years 1912 and 1913 were respectively 20s. 10d. and 19s. 10d., both amounts including a charge of 3s. per ton for development. As your Manager points out, the cost for the first six months of the year was 19s. 2d. as against 20s. 7d. per ton during the six months succeeding the strike. As an indication of the effect of reduced tonnages on working costs, it may be mentioned that with 169,000 tons crushed in June the costs were 18s. 10d. per ton, while, with a tonnage of 127,600 in December, they increased to 20s. 10d.—a difference of 2s. per ton. Although the amount provided in working costs for development was 3s. per ton, the actual amount expended was 1s. 10d., giving a total of £164,816, the balance of £100,534, equalling 1s. 2d. per ton milled being added to the Development Suspense Account, which, at the 31st December, stood at a total of £228,213. Development.—The development accomplished during the year was 56,601 linear feet, and 486,486 cubic feet of sundry excavations, which is slightly less than that for 1912. This footage, however, is considerably short of what is necessary to maintain the ore reserve in a sound position, but the substantial financial provision available will permit of rapidly extending development, when underground conditions permit. The chief contributory causes to the restriction of development have been the delay on the part of the manufacturers in the delivery of the pumping plant, the further interruption to the installation of the pumps, owing to compulsory stoppage of pumping during the strike, and finally, the acute labour shortage during the last six months. It was explained in last years report that the Witwatersrand Deep Water Dyke could only be penetrated after making provision for dealing with the large amount of water anticipated. All arrangements now being complete the intersection of the dyke at various points is being undertaken. The tonnage developed during the year amounted to 1,530,226 tons, of which 904,046 tons, or 59 per cent., was payable, of an average value of 6.9 dwts. The percentage of payability is slightly higher than last year, but the average value is appreciably lower. The reduction in value is accounted for principally by the larger proportion of development having had to be carried out in the Cason or poorer section of your property. The footage of drives at this section alone amounted to 13,975 feet, out of a total of 30,562 feet for all the sections. Further, the total driving in the two mines of the Western and richer section amounted to only 7,940 feet, as against 14,208 feet last year. This was unavoidable on account of the near approach to the water-bearing dye. Ore Reserve.—The payable ore reserve standing at the 31st December, 1913, was estimated to be as follows—Main Reef, 392,376 tons, 5.1 dwts., width 60 in.; Main Reef leader, 3,994,656 tons, 7.0 dwts., width 49 in.; Main Reef and leader (composite), 1,212,968 tons, 6.3 dwts., width 75 in.; total and averages, 5,600,000 tons, 6.7 dwts., width 54 in. In addition to the above there are accumulated in the mine 8,552,867 tons of ore of a value of less than the present pay limit of 4.3 dwts. The reserve shows that, despite the lower value of ore developed during the year, the average value is only reduced by .1 dwt. The decrease in the reserve of some 400,000 tons is the result of the restricted development operations already referred to. Requirements for 1914.—It is estimated that, in addition to the amount brought forward from 1913, a sum of £130,000 will be required for the current year's programme. (The principal items are here enumerated.) Provision has also been made for development work in connection with the opening up of the Angelo Deep Section, and for the cost of alterations necessary to the purpose of concentrating crushing operations by the use of three instead of four reduction plants as at present. Owing to the shortage of labour and the consequent reduced tonnage during the past few months, considerable saving could have been effected had it been possible, as a temporary measure, to close down one of the plants. The alterations proposed are designed to form part of a scheme for concentration of reduction operations at two plants should it be decided upon at some later date. Future Development.—During the coming year the Hercules Section will be opened up by crosscuts, from the vertical shaft on the 23rd, 25th, 26th, 27th, 28th, 29th, 30th, and 31st levels, and it is hoped to make a start on a main incline shaft from near the bottom of the vertical. It is important to the future of the company that the east incline at the Angelo Deep Section should be continued, to open up further levels without delay; and now that the water has been lowered to below the 28th level there, it is expected that sinking will be restarted in the near future. In the western section of the property the Farrar secondary shaft should be sunk to open up the area south of the water dye as soon as the water, when tapped on the 27th level, Angelo Deep, has been drained to below the 23rd level at the Driefontein Section. General—The following are the chief features in connection with the development operations during the year:—Driefontein.—The reef disclosures are an improvement on the previous year, and, so far as values are concerned, this mine continues satisfactory. Angelo.—The good values referred to in last year's report as having been met with on the 23rd and 24th levels have been maintained, and the proportion of payable ore developed on the lower levels amounted to 83 per cent. Comet.—Although the average values at this section are approximately the same as for 1912, it was only during the latter part of the year that any decided improvement took place. The results obtained in the lower levels, viz., 22, 22a and 23 are satisfactory, being: 22a level, 10.4 dwts. over 49 inches for 440 feet sampled; 23rd level, 7.0 dwts. over 67 inches for 40 feet sampled. The 22nd level, which has now been connected with the Hercules shaft, shows a value of 27.0 dwts. over 16 inches for a total footage of 2,000 feet. Cason.—Taken as a whole, the values disclosed by development in this section are lower than last year. The chief point of interest is the 19th level, east, where the values over the last 490 feet of driving were 10.2 dwts. over 35 inches. This drive is now within the boundary of the Blue Sky Section. Hercules.—The Main Reef series was intersected at a depth of 4,236 feet: the values were unpayable. The 22nd level was connected with the Comet Section during the year, and, as has been pointed out, satisfactory values were disclosed. Angelo Deep.—As regards this section, it was not possible to commence development until the preparatory work in the nature of pump chambers, sumps, drains, etc., had been completed and the water lowered to below the 29th level. With regard to the future: Since 1911 the ore reserve has declined approximately by 1,150,000 tons, and although financial provision has been made, through the Development Suspense Account, for replacing the shortage and bringing the reserve into a more satisfactory position, the achievement of this object, taken in conjunction with the maintenance of normal crushing operations, depends on the adequacy of the native labour supply, which, up to the present, does not exhibit any marked improvement. As pointed out in the Manager's report, the supply of natives at the end of the year was 4,541 short of the requirements. It is of paramount importance in view of the shortage in the ore reserve, that development operations should be increased to the maximum as early as possible, even if such a policy should result in a temporary diminution in the tonnage milled. In relation to the labour position, continued attention is being paid by the managament to reducing the number of labourers required by increasing efficiency and introducing labour-saving appliances, such as small rock drills, etc. Your mines, with their steep dips, narrow stoping widths, and the nature of the hanging wall, demand that the greater proportion of ore should be broken by hand labour. In spite of this, however, 350 small machines of various types are at work, but the results so far have not been satisfactory. Experiments are being continued and no effort is being spared to secure a small machine suitable for local conditions. If this object can be achieved, the result will be a material reduction in our labour requirements. The prospects of securing increased development and of maintaining the satisfactory profits of last year depend on a considerable improvement on the existing labour position, without which the results for the ensuing year will not equal those for the period under review.

Chicago-Gaika Development.

The report of the Chicago-Gaika Development Company, Ltd., for the year ended 30th June, 1913, to be presented to the meeting on the 23rd instant, covers the year ended 30th June, 1913, and shows a debit balance of £1,501. This amount, together with £177 for income tax being deducted from the general profit and loss account, leaves a credit balance of £270. During the year it was not possible to realise any of the company's shareholdings to advantage, owing to the depression in all mining securities, and no dividend was paid during the year by the Gaika Gold Mining Company, in which this company is largely interested.

The following cable has been received from Mr. Piper, the company's consulting engineer: " Since my last visit consider prospects mine at depth have considerably improved both in regard to width of reef and values, full stop. No. 20 level face in the north end continuing in very rich ore." January returns were: Mill—40 stamps ran 27·11 days, crushing 6,305 tons of ore; duty per stamp per day, 5·81 tons. Total yield in fine gold, 7,399·9 ozs., equal to 23·47 dwts. fine gold per ton. Tailings, average assay value per ton, 5·55 dwts. fine gold. Slimes plant—Tons treated, 2,429; yield in fine gold, 638·82 ozs., equal to 5·26 dwts. fine gold, per ton. Concentrate plant—Total yield in fine gold, 543·78 ozs. Total fine gold for the month, 8,582·5 ozs. Estimated mine profit, £25,000. Added to reserve, 217·7 ozs. Total gold reserve, 491·28 ozs.

Crown Diamonds.

The following results attended washing operations at the Crown Diamond Mine for the month of February, 1914:—20,801 loads washed, yielding 2,027 carats of diamonds.

Frank Smith Diamonds.

For the month of February the results were as follows:—57,152 loads washed, yielding 2,160 carats. Recoveries for previous three months: November, 1913, 1,632 carats; December, 1913, 1,815 carats; January, 1914, 2,310 carats.

Brakpan Mines.

The following is supplied in respect to the February, 1914, output:—Stamps working, 140; running time, 23 days; ore crushed, 45,030 tons; tube mills working, 8; ore hoisted, 49,277 tons; ore from dump, 1,400 tons; waste sorted, 12·62 per cent.; fine gold declared, 14,257 ozs.; value declared, £60,031, equal to 26s. 8d. per ton milled; working costs, £43,111, equal to 19s. 2d. per ton milled; working profit, £16,920, equal to 7s. 6d. per ton milled.

Natal Collieries—Three Years' Output.

	1913. Tons.	1912. Tons.	1911. Tons.
Natal Navigation	312,387	301,447	347,426
Utrecht	255,156	181,808	147,857
Dundee...	251,093	17,078	82,039
Hlobane	245,173	224,947	214,699
Durban Navigation	238,061	242,866	274,171
Elandslaagte	200,215	213,079	203,405
Glencoe (Natal)	191,365	192,934	176,782
Cambrian	156,629	155,952	155,097
Ballengeich	125,020	91,014	44,773
South African	117,964	126,637	118,553
Hatting Spruit	105,600	87,686	93,044
Burnside	84,639	242,884	157,045
Newcastle	83,474	72,395	64,908
Ramsay	63,520	69,214	57,264
Natal Steam	56,935	61,779	56,220
St. George's	53,824	179,054	171,061
Wallsend (Natal)	33,521	....	....
Fairleigh	12,993	....	....
S.A. (Vryheid) Coke ...	7,568	....	....
Dewar's Anthracite ...	6,731	5,091	3,998
Avon	3,626	1,384	....
Star	2,190	4,266	....
Talana	....	....	20,079
West Lennoxton	....	....	1,689
Zululand	....	....	3,386
Central	....	....	....
Other small collieries ...	724	574	742
Total	2,608,408	2,472,085	2,394,238

Increase in 1908 over 1907: 139,700 tons.
Increase in 1909 over 1908: 116,867 tons.
Increase in 1910 over 1909: 510,077 tons.
Increase in 1911 over 1910: 97,551 tons.
Increase in 1912 over 1911: 77,847 tons.
Increase in 1913 over 1912: 136,323 tons.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

March 13.—Worcester Exploration (annual).
March 16.—Robinson; Crown Mines (special).
March 18.—Anglo-French Coal Estates (annual).
March 20.—Apex; New Kleinfontein; Benoni Consolidated (special).
March 27.—Simmer Deep; Jupiter (annual); Wolhuter Gold Mines; Buck's Reef (annual).
March 31.—Cassel Coal Co. (annual).
May 20.—Apex Mines, New Kleinfontein (Annual).
June 23.—Transvaal Consolidated Lands (annual).

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Engineering Notes and News.

Safety Precautions for Transmission Machinery.

There has just been issued by the Home Office a report on fencing and safety precautions for transmission machinery, prepared by Mr. W. Sydney Smith (H.M Inspector for Dangerous Trades). It is intended to explain, with regard to the several parts of transmission machinery, the safeguards, structural and administrative, which experience shows to be needed for the protection of persons employed. Certain of them are not adequately covered by the existing law relating to "mill-gearing," and it is proposed that the more important requirements should be embodied in regulations to be made under Section 79 of the Factory and Workshop Act, 1901. The formal issue of regulations in draft, however, will be deferred until the occupiers and others concerned have had time to consider the proposals and to submit any observations that they may desire to offer at this stage. The report deals with the different classes of transmission machinery, the causation and incidence of accidents, fencing and other safety precautions which may be adopted, the immedate stoppage of transmission machinery, oiling and cleaning, etc.; and an appendix gives the proposed regulations for such machinery used in any factory or workshop to which the Act above-mentioned applies.

Compressed Air Dust Filter.*

After setting up an air compressor in the vicinity of an ore-reducing plant it was found that ore-dust was drawn through the compressor into the pipe lines and finally into the pneumatic tools, causing trouble and expense. After considerable experimenting with various types of screens, the following was adopted: A piece of 12in. pipe, about 4ft. long, was fitted with cast-iron screwed flanges on both ends. A cast-iron plate, tapped for a 4in. pipe, was bolted to the lower end, also four wrought-iron supporting legs. A wrought grate, made up of strips of 2 × $\frac{1}{4}$in. flat iron with $\frac{3}{4}$in. pipe separators, $1\frac{1}{2}$in. long, and held together with one $\frac{1}{2}$in. bolt $11\frac{1}{2}$in. long, was placed in the bottom. The pipe was filled to within 5in. of the top with stones about the size of a large orange. The stones were dipped in a thick, sticky refuse oil, which happened to be handy at the time, before they were placed in the pipe. As we figured that in time the oil would work to the bottom, a second grate, similar to the other, was placed on top of the stones so the apparatus could be turned over and used in a reversed position. A flange and gasket similar to that on the bottom was placed on the upper end. Drip cocks were also placed near each end so that any accumulated water might be removed. The line from the compressor was then connected to the bottom flange, by nipples, ells, and flanged unions; the same arrangement was used on the upper end to convey the filtered air to the machines. Since installing this device two years ago, we have cleaned it twice, and on each occasion found that a large amount of dirt, lint, etc., had been collected by the oil, without any reduction in the efficient of the oil. This same arrangement can be used on the discharge end of all lines if they are of any great length, as all wrought-iron pipes will shed loose scale, especially when first put in service, also after being out of use for some time.

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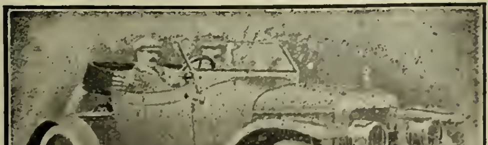
*By W. G. Harris, in the *Mexican Mining Journal.*

1,200-h.p. Electric Winder.

A large electric double-drum main winding set for underground use has just been completed by Sandycroft, Limited, for a mine in India. The particulars of the conditions and duty are as follows:—The depth of wind is 4,000 ft.; the shaft is inclined 65 deg. to the horizontal; the weight of the skip is 2 tons, and the weight of ore raised per trip 3 tons: the diameter of the rope is $1\frac{3}{8}$ in.; the maximum rope speed is 1,200 ft. per minute; the rope speed for shaft inspection is 75 ft. per minute; the maximum horse power is 1,200; two skips are used—one ascending and one descending.

The drums are parallel, 12 ft. diameter, and 3 ft. 6 in. wide between flanges, one being keyed on the shaft, and the other being loose and operated by a clutch, so that the necessary adjustment can be made when it is required to wind from a different level. The drum sides are of cast iron, one side of each drum having a brake-ring cast with it. The lagging is of mild steel spirally grooved to receive the winding rope. Each drum side is made in eight sections, suitable for passing down a shaft 5 ft. 9 in. by 2 ft. 9 in. within the timbers. The arms are of mild-steel bars, the outer ends fitting into recesses in the drum rim and the inner ends into recesses in the cast-iron boss, into which they are secured with bolts. The clutch is of the multiple-tooth type of cast steel and consists of a part keyed and bolted to the drum side and a sliding part working on a hexagon formed on the drum shaft, the two portions having machined teeth which engage with each other; the clutch is operated by means of a hand-wheel and screw. The drum shaft is 14 in. diameter of open-hearth acid steel. The bearings for carrying it are 11 in. diameter by 20 in. long, and are fitted with gun-metal steps with vertical and horizontal adjustment and having large oil boxes for lubrication. The countershaft is $8\frac{1}{2}$ in. diameter, and is fitted with a reversible flexible coupling at one end for coupling up to the motor. The countershaft bearings are of a similar design to the drum-shaft bearings. The bed-frame is built up of 14-in. by 16-in steel joists. It is arranged to carry all the bearings, speed-controlling, and overwind-preventing gear, brake engines and all the necessary operating levers, etc., and is bolted down to the foundations by $1\frac{3}{4}$-in. diameter holding-down bolts. The gear wheels are of Andre Citroen and Company's make, and are of cast steel with triple-helical machine-cut teeth. The spur wheel is built up in sections. The brakes are of the vertical post type, being of mild-steel joists with heavy cast-iron ends for attaching to the anchorage brackets at the lower ends, and to the operating gear at the upper ends. Wood brake blocks, curved to suit the brake rings, are attached to the inside of the posts. Automatic take-up gear is provided for taking up the wear on the brake blocks, and both brakes are operated by air-brake engines of the vertical type, combined with oil cataract cylinders. The brakes are put on by weight, the brake engines holding the weights off when brakes are not operating or allowing the weights to act on the brakes to any desired extent, this being regulated by a lever on the driver's platform.

"Gott's" overspeed and overwind preventing gear of the veritcal-screw type is fitted; this gear also acts as the depth indicator. One of the vertical screws is driven from the fast drum and the other from the loose drum, and in the case of over-speed, overwinding, or starting in the wrong direction, a switch is tripped which operates a solenoid by means of which the brakes are automatically applied and the current to the motor cut off, bringing the winding-gear to rest. If the current to the motor is interrupted through any cause, the solenoid operates a tripping lever which automatically applies the brakes. If the air supply to the brake engines fails or falls below a certain pressure, the brakes are again automatically applied and the current to the motor cut off. This is done by means of a small air cylinder, to the underside of which is connected an air pipe from the brake-engine supply pipe; a weighted trip lever is attached to the piston rod, and when the air is above a certain pressure this lever is held in its top position, but if the air drops below a specified pressure the weighted lever overcomes the resistance of the air pressure on the piston and falls to its lowest position, at the



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"Imperial," Three-seater with Two-seat Dickey.

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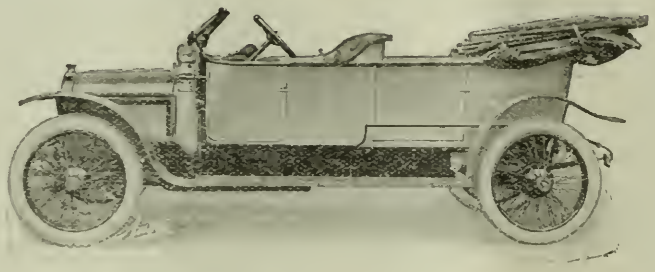
12 h.p. "Sirdar" Phaeton to seat four.



CHASSIS. Four cylinders, bore 3 in., stroke 3½in., giving 12·5 brake h.p. at 1,000 revolutions, and developing fully 16 b.h.p. on acceleration to 1,500 r.p.m.; R.A.C. rating 14·3 h.p., four forward speeds and reverse; gate change speed; adjustable valve tappets; wheelbase 9 ft.; rounded radiator; high tension Bosch magneto; Ferodo sectional clutch; Claudel-Hobson carburettor; Austin detachable wheels; 810 x 90 Michelin tyres.

BODY AND EQUIPMENT. Phaeton body with leather upholstery and horse-hair cushions; Cape hood with side curtains; double folding glass screen with brass fittings; spare wheel and tyre; Lucas paraffin side and tail lamps; "Solar" mirror lens acetylene head lamps, with separate generator; speedometer and mileage recorder; horn, tyre pump, lifting jack, kit of tools and accessories.

PRICE. Complete car as above - - - - - - - - £500 Net.
(A two-seated car can be supplied to order at £460).

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same time operating the brakes and cutting off the current supply to the motor. On the driver's platform is an emergency hand lever which, when operated by the driver in case of sudden need to stop the winder, trips the gear under the platform, operates the brakes, and cuts off the current; the gear can be reset again by moving the emergency lever in the opposite direction, when winding can be resumed. An interlocking gear is provided by means of which the clutch cannot be taken out unless the brakes are on, or the brakes taken off until the clutch has again been put in. A recording apparatus is fixed on the platform, driven from the countershaft by chain gear; this records by diagram the speed and time of each wind, also the number of winds made. There is also a revolution counter driven from the drum shaft. The motor is of the Sandycroft standard slip-ring type and is of specially heavy construction. It is capable of giving a continuous output of 400 b.h.p. and 1,200 b.h.p. during acceleration. It is wound for a 3.100-volt 25-cycle circuit, and has 20 poles corresponding to a speed of 146 r.p.m. The windings are rigidly supported at their ends to prevent distortion, and the insulation is of a special type to withstand the conditions found underground in India. The bearings are provided with means for adjustment in all directions so that it is at all times possible to centre the rotor without difficulty.

Evolution of Suction-Gas Power.*

WESTRALIAN LESSONS FOR SOUTH AFRICA.

The first suction-gas plant at Kalgoorlie was installed on the Great Boulder mine in 1907 for firing roasting furnaces. The experiment proved a failure, as it was found that there was not sufficient heat in gas generated from charcoal when it came to forced work, and the management reverted to the wood-fired furnaces to get the required output from them. In 1908 a suction-gas plant was installed on the Great Boulder No. 1 Company's St. George mine at Mt. Magnet, but proved a source of annoyance for a time until it was understood. About the same time Messrs. Moss Bros. installed a small plant at their treatment works at Kalgoorlie. In 1909 two suction-gas engines of 50 h.p. each were installed in Kanowna to drive custom stamp-mills, and, in the same year, six suction-gas engines varying from 30 up to 80 h.p. were installed in small treatment plants around Kalgoorlie. Although giving general satisfaction and requiring little attention, even from laymen, there was a constant liability to intermittent trouble from the sudden overheating of the cylinder, which no one could explain. At this time Mr. Truman, a custom mill operator, installed an 80 h.p. engine on the Mt. Ferrum mine, and discovered that the cause of the trouble was the opening of the air valve too wide, and excessive heat resulting from an excess of hydrogen in the burning gas. Mr. Truman generously made his discovery known, and, since then, no complaints regarding suction-gas plants have been heard, as it was proved that any excess of heat could be immediately checked by regulating the air valve. Since then the number of these engines has largely increased, and is still increasing. At all the outside centres, such as Ora Banda, Leonora, Mt. Morgans, Black Range, Meekatharra, and Bullfinch, suction-gas power has quite superseded steam for operating treatment plants. In spite of the economy which can be effected by their adoption, gas engines are unlikely to supersede steam on the large mines at Kalgoorlie, as large electric plants have been installed. The great advantage of suction-gas plants is that they require little attention and practically no technical knowledge. So far as Western Australia is concerned, all the plants were operated by charcoal-gas generators well into 1912, when a wood-consuming generator, previously tried in New Zealand, was introduced. This generator has a down instead of an up draft, and can be fired with wood, shavings, or sawdust, in addition to coal, lignite, coke, or charcoal.

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*By J. C. Auldjo, in the *Mining and Scientific Press.*

Professor Buchanan, consulting engineer to the New Lisbon-Berlyn G.M. Co., is reporting on a power line for the mine from Waterval.

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CAST STEEL VALVES

For 1,300lbs. Working Pressure.

STOCKS IN JOHANNESBURG AND DURBAN.

Victoria Falls and Transvaal Power.

The Debenture issue of the Victoria Falls and Transvaal Power Company, which has been talked about for some time, has been duly made in London. It takes the form of £650,000 5½ per cent. "B" second mortgage bonds, which have been purchased by Messrs. Emile Erlanger and Co., and are offered on their account. The Debentures form part of an authorised total of £2,000,000, of which £1,650,000 has been issued and £1,626,500 is outstanding, and rank after the £3,000,000 first mortgage bonds. Subject to the latter, they are charged on all the assets of the undertaking, and are redeemable by 1936 by annual drawings at 103 or by purchase in the market at or below that figure or by the whole amount outstanding at any time being paid off at 103 on six months' notice. A letter from the chairman of the company sets out the profits for the last seven years, those for 1913 being estimated at £465,000, as compared with £446,400 for 1912; in 1907 the figure was £45,100. Further developments and extensions are expected to ultimately raise the profits to £720,000; but this calculation seems to be rather a rule of thumb one. The service of the First Debentures and income-tax, takes £328,000, leaving a balance on the £720,000 estimate at £392,000 available for the Second Debentures. This would cover the service of 1,650,000 of the latter not quite three times over. On the basis of last year's estimated earnings, however, there is a protective margin of only £5,700. The Debentures are offered at 92, which compares with 93, the price of those already on the market, and gives a yield of nearly 6 per cent. A full half-year's interest is payable on 1st July, whilst the payments of subscribers can be spread out till 7th April.

MINING MEN AND MATTERS.

Professor H. J. S. Heather has taken up his duties at the South African School of Mines.

* * * *

Mr. Austin King, Director of Mines in Manicaland, goes to England by the Llanstephan Castle on April 9th.

* * * *

Mr. W. T. Anderson, general manager of the East Rand Proprietary Mines, left for Capetown this week, and will sail for England by the Armadale Castle. Mr. Ross Skinner will fill his place in his absence.

* * * *

Mr. J. W. Kirkland, of the South African General Electrical Company, and President of the South African Electrical Engineers, returned to Johannesburg this week after a four months' visit to England and America.

* * * *

The list of certificates issued by the Mines Department from 1st January to 28th February, 1914, is as follows:—Mine managers: Metaliferous mines: H. C. W. Johnston, H. C. F. Bell, W. S. New, W. M. Chalmers, J. C. Daly, A. J. Anderson, G. S. T. Brinton, G. Kope, H. H. Burslem, L. P. de Castle, J. P. Cornwall, R. D. McLeish, J. Crozier, S. C. Thomson, S. F. Phillips. Collieries: A. J. Green and E. C. Ranson. Mine overseers (from 5th February to 28th February): Metalliferous mines: R. W. Payn, C. J. French, C. H. Langley, T. H. Hoskin, R. H. Williamson. Collieries: H. Williamson, G. W. Muir, C. W. Thomson.

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JOHANNESBURG.

Finance, Commerce, and Industries.

Government Securities for the Small Investor.

Arrangements have now been completed by which Union of South Africa Local Stock, bearing interest at the rate of 3¾ per cent., calculated half-yearly, may be purchased at £97 2s. 6d. per cent., on application at any postal money order office within the Union. The stock will be issued in sums of £10, £50, £100, £500 and £1,000 respectively, either as "inscribed stock," the amount of which will be registered in the Treasury in the holder's name, or "stock certificates," payable to bearer. Special facilities have been arranged for depositors in the Post Office Savings Bank by which any sums they may wish to invest may be withdrawn from their accounts and passed direct to the Public Debt Commissioners, who will transfer stock for the amounts desired.

* * * *

The Natal Bank.

The directors of the Natal Bank are to be congratulated on the satisfactory position it maintains on the completion of the 60th year of its existence. As usual at the annual meetings of the Bank, Mr. P. Davis delivered last week an informative speech dealing with the Bank's business, and with the economic conditions of the country. If the Bank has made no important new departure during the year, and cannot report any great widening in its operations, it has been pursuing a careful policy, adapted to the rather trying times through which South Africa and the financial world have been passing. The most notable variation in the present accounts, as compared with those in the previous report, is a decrease of over £478,000 in deposits; but this was explained by the chairman as being largely due to the more profitable uses which capital has found during the industrial activity that has prevailed in England. The chairman took a hopeful view of the commercial, agricultural, and industrial prospects—an optimism encouraged by the success of the Government in dealing with the labour troubles, and the evidences of a distinct relaxation in the recent monetary stringency. The question as to increasing the capital of the Bank and extending its operations was again brought up, and discussion showed that it was regarded by the directors as premature.

* * * *

Building Activity in the Union.

Seven municipalities in the Transvaal Province during the month of January approved plans having an estimated value of £83,676, as against £81,614 for the month of December, showing a decrease of £928. Twelve municipalities in the Cape Province approved plans having an estimated value of £63,234 12s. Durban Municipality passed plans having an estimated value of £32,131. Bloemfontein Municipality passed plans having an estimated value of £7,380. The following are the estimated values of buildings the plans of which have been approved by the undermentioned Municipal Councils for the month of January, 1914: Johannesburg, £63,011; Benoni, £1,755; Boksburg, £140; Germiston, £3,000; Krugersdorp, £2,610; Pretoria, £12,160; Roodepoort, £1,000; Sea Point, £2,375; Capetown, £20,695; Woodstock, £1,450; Maitland, £2,000; Rondebosch, £2,305; Claremont, £1,100; Kalk Bay, £1,500; Wynberg, £6,000; Simonstown (three months), £16,700; Kimberley, £5,570; Queenstown, £300; East London, £3,239 12s.; Durban, £32,131; Bloemfontein, £7,380; total, £186,401 12s. Tenders accepted by Government for public buildings during the month, and not included in the above amount, £88,144 5s. 6d.

* * * *

A New Line of Steamers.

Messrs. Attwell & Co., of Capetown, have received cable advice from Messrs. Houlder Bros., Ltd., London, advising them that the latter have bought ten steamers ranging from 6,000 to 8,000 tons—of a new improved transport type—which has been successfully floated as the Roumania Empire Steam Navigation Co., Ltd.

* * * *

Money in Ostriches and Sheep.

In giving evidence before the Dominions Commission last week, Mr. Liberman, ex-Mayor of Capetown, said that ostrich feathers 20 years ago fetched £10 per plucking; now they only realised £3. He said consumers in the shape of wearers of feathers paid quite as much as before. There was no co-operative association to prevent the middleman getting an enormous price. The man with £2,000 could reasonably expect £500 a year gross profit on ostrich rearing. Mr. Liberman said that South Africa was quite able to be self-contained, and could produce all dairy products necessary, but he could not suggest by what means. Mr. Van Breda, of Van der Byl & Co., and Mr. Oxenham, of Ebel & Co., were examined at length, in connection with wool, mohair, hides, and skins. Mr. Oxenham said they were pleased to say that last year the Union exported half a million bales. The middleman was an undesirable factor in this case. He was in the majority of cases a shopkeeper from whom the grower bought goods, and with whom his credit was pledged. Proceeding, Mr. Oxenham said the shopkeeper paid the farmer the same price, whether the wool was excellent or of inferior quality. Consequently, there was little inducement to produce good wool. Years ago they induced farmers to join together and have wool sales in certain districts, since when there had been a marked increase, both in the output and the quality in those districts. They tried to arrange a sale without Government help, and had been fairly successful. Witness said that Germany took all South Africa's best wool for the purpose of making uniforms.

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THE WEEK IN THE SHAREMARKET.

Quiet and Featureless—Firmer Undertone with Little Business.

Very little business was done this week, though the tone improved towards the close. Sub Nigels were bought on the prospects of increased profits from the additional plant; and Modder Deeps and Van Ryn Deeps enjoyed some activity. It would appear that the clouded political outlook in the United Kingdom is frightening investors out of all markets, and until the nature and fate of Mr. Asquith's peace proposals are determined, no lead can be expected from London. Tin remains inactive, the price of the metal being a bear factor, and diamond syndicate shareholders suffer from the temporarily restricted demand for the product. In both these directions an early improvement is expected.

* * * *

	Fri., 27th.	Sat., 28th.	Mon., 2nd.	Tues., 3rd.	Wed., 4th.	Thurs., 5th.
Adair-Ushers	0 4*	—	—	—	0 4*	0 9†
Afrikander Props.	—	—	—	—	—	15 0†
African Farms	14 6	14 3*	14 6	14 3*	14 6	14 0*
Apex Mines	18 0*	18 0*	18 0*	18 0*	18 6*	19 6*
Aurora Wests	9 6*	—	—	—	—	—
Bantjes Consolidated... ...	14 0*	—	14 0*	14 0*	14 3*	14 3*
Benoni Consolidated	1 9*	1 10	1 10*	1 10*	1 10*	1 10
Blaauwbosch Diamonds ...	—	85 0*	87 6*	80 0*	85 0*	85 0*
Brakpan Mines	—	50 0*	52 0*	—	50 0*	50 0*
Breyten Collieries	29 0*	29 0*	29 0*	29 0*	29 0*	30 6†
British South Africa... ...	19 3*	—	—	—	—	—
Bushveld Tins	0 6*	0 6*	0 6*	0 6*	0 6*	0 6*
Cassel Coals	13 6*	13 0*	13 0*	—	13 6*	13 6*
Cinderella Cons.	—	—	—	—	5 6*	—
City and Suburbans	43 0	42 9*	43 0*	43 0*	43 0*	43 6
City Deeps...	60 0*	—	60 0*	60 6*	60 0*	60 0*
Cloverfield Mines	4 6*	4 9	4 9*	4 10	4 10	4 11
Clydesdale Collieries... ...	9 6*	10 6*	9 6*	9 6*	9 6*	9 6*
Concrete Constructions ...	1 6*	1 6*	—	2 0*	2 0*	2 0*
Cons. Gold Fields	—	—	—	46 3*	—	—
Cons. Langlaagtes...	29 3*	—	29 6*	29 6*	29 6*	29 6*
Cons. Main Reefs	17 9	17 6*	17 6*	18 0	17 6*	17 6*
Cons. Mines Selection... ...	8 9*	—	8 0*	8 0*	8 0*	8 3*
Coronation Collieries	20 6*	20 0*	20 0*	22 0†	22 0†	21 0*
Coronation Freeholds... ...	0 6†	0 4*	0 6†	0 4*	0 4*	0 4*
Coronation Syndicates ...	4 0†	3 3*	—	3 0*	—	4 0†
Crown Diamonds	8 3*	8 3*	8 3*	8 3*	8 3*	8 3*
Crown Mines	—	—	—	—	—	120 0*
Crown Mines Debentures	—	£88*	£98*	£98*	—	£98*
Doornhoek Tins	3 0†	3 0†	3 0†	1 6*	1 6*	2 0*
East Rand Centrals	2 4*	2 4*	2 4*	2 6*	2 6*	2 6*
East Rand Coals...	1 8*	1 7*	1 7*	1 7*	1 7*	1 7*
East Rand Deeps	1 6*	1 6*	1 6*	1 8*	1 8*	—
East Rand Props.	—	40 0*	40 0*	40 0*	40 0*	40 0*
East Rand Debentures ...	£85*	£87½†	£80*	£85†	—	—
Eastern Gold Mines	1 3*	1 3*	—	1 3*	1 3*	1 3*
Ferreira Deeps	45 0*	—	45 0*	45 0*	—	—
Frank Smith Diamonds ...	5 9*	5 9*	6 4	6 3	6 0*	6 0*
Geduld Props.	24 0*	—	25 0*	24 0*	24 0*	23 6*
Geldenhuis Deeps	23 0*	—	23 0*	23 0*	—	—
Glencoe (Natal) Collieries	6 6*	6 9*	7 0	6 6*	—	6 9*
Government Areas	19 9	19 6	19 9	19 6*	19 9	19 6*
Jhb. Board of Executors	25 0†	25 0†	25 0†	25 0†	—	25 0†
Jupiters	—	—	3 6*	—	—	—
Kaalfontein Diamonds ...	0 3*	0 6†	0 6†	0 4	0 3*	0 5†
Kleinfontein Estate	—	—	—	22 6†	22 6†	22 6†
Klerksdorp Props.	2 4*	2 5*	2 4*	2 4*	2 4*	2 4*
Knight Centrals	9 9*	9 9*	10 3	10 0	10 0	10 0*
Knights Deeps	31 0*	32 0*	—	—	34 0†	33 0†
Lace Props.	3 3*	3 0*	3 3	3 3	3 1*	3 0*
Luipaardsvlei Estate	9 6*	9 6*	9 6*	9 6*	9 9*	9 8*
Lydenburg Farms	2 9*	2 6*	2 9*	2 9*	2 10*	2 10*
Main Reef Wests...	8 6	8 6	8 3*	8 0*	8 3*	8 0*
Main Reef West Debs. ...	£70*	—	—	£70*	£70*	—
Middlevlei Estates	1 0*	1 3†	1 0*	1 0*	1 0*	1 1*
Modderfontein Deeps... ...	41 6	41 9	42 6	42 6	42 0*	42 3*
Modderfontein B....	81 6*	81 0*	82 0*	82 0*	81 6*	82 0*
Natal Navigation Colls. ...	15 0*	15 0*	—	—	—	—
New Boksburgs	—	—	—	—	0 9*	—
New Eland Diamonds... ...	27 0*	—	27 0*	27 0*	27 0*	27 0*
New Era Cons.	6 0*	7 0†	6 0*	6 0*	6 0*	—
New Geduld Deeps	1 10*	1 10*	1 10*	1 10*	1 10*	1 10*
New Kleinfonteins	24 3	24 0*	24 3	24 3*	24 3*	24 3
New Modderfonteins	240 0*	—	—	240 0*	—	240 0*
New Rietfonteins	—	—	3 0†	1 0*	1 0*	2 6†
New Unifieds...	—	—	15 6†	16 0†	16 0†	15 6†
Orange Diamonds	1 6*	1 6*	1 6	1 7	1 6*	1 6*
Piggs Peak	9 6*	—	—	9 6*	9 6*	9 6*
Pretoria Cements	—	—	44 6*	45 6*	46 0*	46 0*
Princess Estate	—	—	4 9*	5 0*	5 0*	5 0*
Rand Klips	2 3*	2 3*	2 3*	2 6	2 4	2 3*
Rand Nucleus	1 9*	1 9*	1 9*	1 9*	1 11	1 9*
Randfontein Deeps	4 0*	4 3†	3 11*	4 3†	3 9	—
Randfontein Estates	—	—	22 9*	22 0*	22 6	—
Robinson Deeps	27 6*	30 0†	—	30 0†	—	—
Rooiberg Minerals...	25 0*	25 0*	25 0*	25 0*	25 0*	25 0*
Ryan Nigels	3 0*	3 0*	—	3 0*	—	3 0
Shebas	5 0*	5 0*	5 0*	5 0*	5 0*	5 0*
Simmer Deeps	2 3†	2 6†	2 3†	1 0*	1 0*	2 0†
S.A. Breweries...	39 0*	39 6*	39 6*	—	—	—
S.A. Diamonds...	30 0*	—	—	—	30 0*	30 0*
S.A. Lands	3 1*	3 1	3 0*	3 0*	3 1*	3 1*
Springs Mines	13 9*	13 9*	13 9*	14 4*	—	—
Sub Nigels	11 6	11 3*	11 9*	12 6	12 3*	12 6
Transvaal Coal Trust ...	35 0†	33 0*	34 0†	33 0*	34 0*	33 0*
Transvaal Cons. Lands ...	—	—	—	18 6*	—	21 0*
Transvaal G.M. Estates ...	45 0*	42 3*	42 0*	—	44 6*	45 0*
Tudors	0 6*	—	—	1 0*	1 0*	1 0*
Van Dyks	1 0*	1 0*	1 0*	1 0*	—	—
Van Ryn Deeps...	42 3	42 0	—	42 6*	42 3*	42 6
Village Deeps	—	—	—	—	32 6*	33 0*
Vogelstruis Cons. Deeps ...	—	0 10*	0 10*	—	—	—
West Rand Cons.	7 6*	—	—	—	—	—
Western Rand Estates ...	4 0†	—	—	—	—	—
Witbank Collieries	47 6*	46 0*	45 0*	—	44 6*	45 0*
Witwatersrands...	66 0*	65 0*	66 6*	66 6*	66 6*	66 6*
Witwatersrand Deeps ...	53 0*	52 0*	52 6*	52 6*	52 0*	52 0*
Witwatersrand Townships	24 0†	—	19 3*	—	—	—
Wolhuters	13 0*	—	13 0	13 6	14 0	14 0*
Zaaiplaats Tins	30 0	29 6*	29 9*	29 6*	29 6*	29 6*

*Buyers. †Sellers.

*Buyers. †Sellers.

CORRESPONDENCE AND DISCUSSION.

Refractory Ores.

To the Editor, *South African Mining Journal*.

Sir,—It was highly gratifying to read the announcement in your last issue that a company is being formed to operate a new process for the treatment of refractory auriferous ores, and that the Woodbush mine is to be re-opened with the object of practically testing the merits of the process. The venture will have the good wishes of all interested in the re-opening of old fields and propositions which to-day are derelict, not on account of unpayable values, but owing to improper methods and unskilful management. There are many mines, more or less developed and equipped, of refractory ores in the Barberton district which would yield handsome returns to the enterprising capitalist of moderate means, if only commonsense metallurgical process were applied to suit the individual mine. There are evidences that people are realising that the amalgamation-cum-cyanide process of the Rand, wonderfully successful as it has been here, is not the alpha and omega of metallurgy, and that, although the Rand process has not been applied successfully to refractory ore propositions, such as are met with in the Barberton district, there is no reason to regard the majority of these propositions as altogether hopeless. There is indeed no reason why a single property in this category should be idle simply on account of the so-called refractory nature of the ore; there are many metallurgical processes from which one could select that most suitable to the peculiarities of the ore to be treated. Only recently the metallurgist in charge of a well-known Australian mine formulated a process to deal with the ore which up to that time could not be treated at a profit; this process was founded upon the fact, long known to metallurgists, that the precious metal was volatilisable when its containing ore was roasted with an admixture of common salt. According to the latest advices, this process is exceedingly successful, and no matter how refractory or complex the ore, the extraction is most satisfactory. This statement is made with the hope that owners and others interested in similar propositions will be encouraged to stick to their holdings, and test other extraction methods before abandoning their ground in despair.—Yours, etc.,

LEWIS WATKINS.

New Companies.

The following new companies, increases and decreases of company share capital, and liquidations of companies have been registered at the Registrar of Companies Office, Pretoria, during February :—

NEW COMPANIES.

Tavistock Coal and Coke Company, Ltd., 57, 58, 59, National Bank Buildings. Johannesburg; capital, £30,000.

L'Estrellita Tango Tea Rooms, Ltd., 222, St. Andries Street, Pretoria; capital, £1,000.

The Carbona Manufacturing Company, Ltd., 253, St. Andries Street, Pretoria: capital, £500.

The Rand Baking Company, Ltd., 63 and 65, De Korte Street, Braamfontein Johannesburg; capital, £7,000.

The Pioneer Tins, Ltd., 100, Stock Exchange Buildings, Johannesburg; capital, £1,000.

Estates, Ltd., 2, Breda's Chambers, Rissik Street, Johannesburg: capital, £200.

Adamson and Chapman, Ltd., Naboomspruit, Waterberg, district Transvaal; capital. £3,000.

City Wine and Spirit Company, Ltd., 153, Pretorius Street, Pretoria: capital, £1,500.

The Linoleum House, Ltd., 163, corner of Commissioner and Delver Streets, Johannesburg: capital, £2,000.

The United Mineral Water Factories (Pretoria), Ltd., 119, Vermeulen Street, Pretoria; capital, £12,500.

The Robinson Deep Stone Crushing Company, Ltd., 22, Corporation Buildings. Johannesburg; capital. £1.200.

East Gate Buildings. Ltd., African Board of Executors and Trust Co., Ltd., Buildings, Johannesburg; capital. £4,500.

B. L. and J. L. Wides, Ltd., 5, 6, and 7, Corporation Buildings. Johannesburg; capital. £10.000.

Jays. Ltd., Stand 1565. Pritchard Street (Central City Buildings). Johannesburg; capital, £1.000.

Whyte and Turpin. Ltd., 7 and 17. Norwich Union Buildings, Fox Street, Johannesburg: capital. £3.000.

Picot and Company, Ltd., 17. Winchester House, Johannesburg; capital, £1,000.

INCREASES AND DECREASES OF CAPITAL.

East Rand Central Mines. Ltd.. Johannesburg; capital decreased from £175.000 to £87,500.

New North Clewer, Ltd., Johannesburg; capital increased from £20,000 to £35,000.

The National Diamond Prospecting and Developing Syndicate, Ltd., Johannesburg; capital increased from £140,000 to £170,000.

VOLUNTARY LIQUIDATIONS.

Transvaal Transport and Trading Company, Ltd., Lydenburg.
Treasury Gold Mines, Ltd., Johannesburg.
Vlaklaagte Tin Prospecting Syndicate, Ltd., Johannesburg.
May Bioscopes. Ltd., Johannesburg.
Fine Bros., Ltd.. Johannesburg.
West Rand Chemicals, Ltd., Johannesburg.

New Patents.

19. Robert Barnfather.—Improvements in and relating to inflating devices for the pneumatic tyres of road vehicles.
20. Robert Barnfather.—Improved means for securing tyre inflating attachments to the wheels of road vehicles.
21. Heinrich Flottmann.—Improvements in motors for gig-conveyors.
22. Henry Leitner.—Improvements in means for controlling electric circuits.
23. Paul John Simmen.—Improvements in and relating to train dispatching and signalling systems.
24. Paul John Simmen.—Improvements in and relating to systems and apparatus for the automatic control of the speed of moving vehicles.
25. Frank Clayton Herbert.—Device for preventing the fraudulent refilling of bottles.
26. James Moore Holman and John Leonard Holman.—Improvements in feeding fluid to hollow rock drills.
27. George H[illegible].—Improvements in and relating to fencing.
28. Charles Hammar.—Improved automatic milking apparatus.

WANTED.

Engineering Draughtsman, one used to colliery work and having some knowledge of surveying and levelling preferred. Apply, stating age, qualifications, copies of recent testimonials, and salary required, to

"DRAUGHTSMAN,"
C/o S.A. Mining Journal,
Box 963, Johannesburg.

The Albu Group.

The following are the details of results regarding the February operations of the producing mines of the General Mining and Finance Corporation Group:—

Company.	Stamps.	Tons Crushed	Total Cost.
Aurora West	80	12,220	£13,099
Meyer and Charlton	75	13,584	12,220
New Goch	120	27,000	22,250
Roodepoort United	55	23,500	20,437
Van Ryn	135	35,000	27,452
West Rand Consolidated ...	100	22,000	23,165
	565	133,304	£118,623

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	21/ 5·3	£15,024	£1,925
Meyer and Charlton	17/11·9	32,768	20,548
New Goch	16/ 5·8	29,631	7,381
Roodepoort United	17/ 4·7	20,455	18
Van Ryn	15¾ 8·2	46,303	18,851
West Rand Consolidated ...	21/ 0¼7	26,292	3,127
		£170,473	£51,850

Union Banking Half-Year.

The December returns of the banks operating within the Union show that there has been a striking change in the general position since June. The following table, showing the movements in advance and deposits in each Province during the half-year, may be studied with interest. Cape Province.—Deposits: June 30, 1913, £13,598,900; December 31, 1913, £13,471,000; decrease, £127,900. Advances: June 30, 1913, £11,763,600; December 31, 1913, £12,777,700; increase, £1,014,100. Transvaal.—Deposits: June 30, 1913, £15,399,200; December 31, 1913, £14,335,000; decrease, £1,064,200. Advances: June 30, 1913, £12,602,900; December 31, 1913, £11,571,200; decrease, £1,031,700. Natal.—Deposits: June 30, 1913, £5,001,400; December 31, 1913, £4,658,300; decrease £343,100. Advances: June 30, 1913, £4,262,500; December 31, 1913, £4,056,000; decrease, £206,500. Orange Free State.—Deposits: June 30, 1913, £1,938,700; December 31, 1913, £1,793,400; decrease, £145,300., Advances: June 30, 1913, £3,968,500; December 31, 1913, £4,135,500; increase £167,000. Deposits within the Union have declined by £1,680,500, each Province having contributed, though in a varying degree, to the result. "Floating" deposits have declined at the rate of 7.1 per cent., and "fixed" deposits at the rate of 1.3 per cent. Consequently the percentage of "fixed" to total deposits, which has always been high in South Africa, has increased two or three points during the half-year. It will be seen that the biggest drop in the total has occurred in the Transvaal.

Worcester Exploration and Gold Mining Company, Limited.

(Registered in the Cape Province and Incorporated in Transvaal, Union of South Africa.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN in terms of Section 32 of the Trust Deed, that the Ordinary General Meeting of Shareholders will be held in the Town Hall, Worcester, C.P., on Friday, 13th March next, at 10 a.m., for the purpose of receiving Directors' Report, Balance Sheet and Profit and Loss Account to 31st December last; for the election of two Directors in place of Messrs. J. W. Bosman and H. C. Meiring, who retire, but are eligible for re-election; for election of two Auditors and for General Business.

Nominations must be sent in in writing to the Secretary on or before the 27th February next.

The Share Register will be closed from the 5th to the 13th March inclusive.

By Order,
M. S. FALCK, Secretary.

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CONTENTS.

PAGE
Notes and News 29
Topics of the Week:
The Government and the Life of the Rand 31
The Reorganization of Native Labour on the Mines 31
What is Wrong with South African Mining?—V. 33
The Year with the Randfontein-Langlaagte Group ... 34
French Foreign Bondholders and Rand Companies ... 35
Barnato Group Subsidiaries 35
The East Rand Proprietary Report 36
Mining Men and Matters 36
Certificates of Competence 37
Rand Gold Mines in 1913 38
Developments at the Wolhuter 39
Rhodesian Section:
Latest Mining News 40
Correspondence and Discussion: "The Lot of the Rand Mining Student"; "National Diamonds" 41
A Year's South African Insolvencies and Company Liquidations 42
Grade, Costs, and Profits in January 44
The February Output in Detail 45
Engineering Notes and News 49
Progress of the S.A. Institute of Electrical Engineers 49
Finance, Commerce and Industries 51
The Week in the Sharemarket 52
Automobile Notes 53
Company Meetings: Robinson Group 54

Notes and News.

Alluvial Rush in Lydenburg District.

The big finds of alluvial gold recorded from time to time on Mount Anderson, in Lydenburg district, by diggers who have been working there, culminated last month in a big rush to secure claims on the slopes of the mountain. During the last fortnight or three weeks a thousand licences have been taken out, and the most likely parts of the mountain have been fully pegged. Several local syndicates have been busy, and some have pegged-off good selections. But the pegging has not been restricted to local diggers; syndicates from Johannesburg and Pretoria have pegged large blocks, and there is talk of big nuggets being unearthed.

* * * *

Important Changes.

Rumours of important changes in the personnel of Rand mining houses multiply. Mr. W. L. Honnold is leaving at the end of the year, and Mr. F. D. P. Chaplin is reported in the *Times* to be succeeding Sir William Milton in Rhodesia in July. Other Corner House changes are on the tapis, and Mr. George Nathan is retiring from the General Mining and Finance Corporation. In these gentlemen the Rand will lose some of its most able administrators, and at a time when the outlook is still somewhat clouded, we cannot pretend to regard their loss with equanimity.

* * * *

The Colour Bar.

The *Rand Daily Mail* has given prominence during the week to a series of articles by Mr. W. Wybergh, in which an appeal is made to the trades unions of the Rand to admit coloured labour into their ranks. Mr. Wybergh warns white workers that the alternative is the "scabbing" on them by coloured workers in times of strike. He conveniently ignores the manifesto of the Federation of Trades, which still remains in force, calling on everyone to boycott all employers of coloured labour. The question now arises: whom are we to believe? Does Mr. Wybergh voice the Labour view, or does the Federation of Trades? Labour cannot have it both ways!

* * * *

South African Tins, Ltd.

South African Tins seem to have come to the end of their tether, notwithstanding all the money that has been put into the development of the property. Never was mine more loyally supported by its directors and biggest shareholders, and some of these have sustained big personal losses in financing the property. The immediate future of the company lies with the bank and one of the biggest shareholders, who is also one of the chief creditors. An official statement may shortly be expected.

* * * *

Cape to Cairo Oil.

Since its promoter, Mr. A. J. Green, returned to London, nothing has been heard of the Cape to Cairo Oil Shale Development Syndicate, Ltd. A wag has suggested that the London Board is waiting till the Cape to Cairo railway is completed before operations begin, but this is cold comfort to the small body of expectant shareholders on this side. Mr. Cunningham Craig's report cannot be blamed for the inactivity, as his condemnation did not extend to oil shale.

* * * *

A Libel on Katanga.

Sceptics who still question the productive capacity of the Katanga copper fields—and the market is full of them—will be amused at a statement attributed to Mr. Wilson Fox by a *Star* interviewer this week. The Union Miniére, Mr. Fox is made to say, is exporting quantities of *copra*. Now, copra, as all East Coast travellers know, is a product of the invaluable cocoanut; and the cocoa palms, it may be remembered, are sometimes called "the Consols of the East." Our first thought, therefore, on reading the statement, was that the Union Minière had abandoned their protracted struggle to produce copper and gone in for the more profitable cultivation of a cocoa palm "shamba" instead. The office explorer, however, tells us that the palms only flourish at sea level, and as the territory of the Union Minière is a high inland plateau we are compelled to conclude therefrom that "copra" is merely our contemporary's misprint for "copper," the production of which is, after all, the chief object of the company's present activities.

* * * *

Madagascar Oil and Cape Exploiters.

Apparently some Capetown people interested in the flotation of certain Madagascar oil syndicates want watching. The pious folk of Snoekopolis are wont to hold up their hands and warn all comers to beware of the Rand, but in matters of syndicate flotation they have little to learn from us. Last week, for instance, we printed an extract from what purported to be a report made by a Mr. Dufty to the shareholders of the Sakalava Oil Co., in Johannesburg. It was a very glowing report, indeed, and it made light of the item of transport costs on the island, which are notoriously heavy. It represented Mr. Dufty as saying that the cost of moving machinery was only £1 per ton. It struck us as "fishy" that so favourable a report should be advertised in a Capetown paper, and the extracts we reprinted were accompanied by the remark that Rand shareholders in the venture would read the statements with a more critical eye. The immediate effect of our criticism was to bring us a visit from the chairman of the Sakalava Co., who explained (a) that the advertisement in question was neither effected nor paid for by his company, and (b) that the statement regarding transport costs attributed to Mr. Dufty was never made by that gentleman, but was interpolated in the text to serve the purpose of the advertisers. The Chairman further satisfied us on the point by producing the original report signed by Mr. Dufty, and the published report of that expert's speech to the Sakalava shareholders, neither of which contained any reference to a transport charge of £1 per ton. In fact, the real cost, the chairman informed us would more likely be £8 per ton. It is clear, moreover, that neither the Sakalava people nor Mr. Dufty sanctioned the inclusion of the misstatement in his report, or had anything to do with the publication. The question then arises: Did the Capetown firm who paid for the advertisement, doubtless because of its favourable effect on the flotation of certain ground under option to them, adjoining that of the Sakalava, know of the material misrepresentation contained therein? Perhaps the *South African Review*, in which the advertisement appeared and which never has a good word to say about the Rand, will turn its searchlight nearer home and probe the mystery to the bottom!

* * * *

The Colour Bar in Indian Mining.

An instructive lesson in regard to the colour question in mining comes from India. Upon the five producing mines of the Mysore gold field approximately 30,000 persons are employed, and of these only 1 per cent. are whites. Coloured employees not only undertake the duties of unskilled labourers, but, as in West Africa, are also employed as carpenters, smiths, engine drivers, mining contractors, blasters, timbermen, firemen, landers, and "maistries," or overseers. Their wage averages about 30s. per month, that of the miners being about 38s., of underground coolies 20s., and of surface coolies 12s. per month. The European and Eurasian employees, including assistant engineers, reduction officers, millmen, carpenters, smiths, engine drivers, miners, blasters, timbermen, cyanide chemists, pitmen, etc., earn an average of £20 per month. They obtain various concessions under the three years' agreement generally entered into with Messrs. John Taylor & Sons, rarely enjoyed by officials and workers upon other mining fields which are able to recruit their employees locally.

What to do with the Dumps.

Mr. S. H. Pearce, of the Crown Mines, has patented a method of coagulating the surface of sand dumps. Apropos of this, the manager of the East Rand Proprietary Mines, in his annual report, writes:—"The experiments to allay dust from the surface dumps, referred to in last year's report, have been continued. The dump on the Driefontein Section has been covered with an emulsion which has proved effective, and the method is now being applied to the other dumps on the property." Here, perhaps is a solution of the old question of how to deal with the dumps.

* * * *

Secrecy and the "Small Man."

Commenting on the meagre publicity given to the Lydenburg district, the *Pilgrims Rest and Sabie News* says: "The view that it is not expedient to publish the fluctuations in gold production of the different mines is based on false and elusive premises. Mr. Von Dessauer, who is well known in mining circles both here, on the Rand, and in Europe, in the course of an interview, stated that nothing would ever be done to exploit these fields till all the gold producers frankly informed the public what they were doing. 'What is keeping your district back,' he explained, 'is the reticence of the small owner.' It is not as though our district was the only one which was the 'Mecca' of the small capitalist. In this district, omitting reference to the T.G.M.E., Glynn's Lydenburg and Ceylon Lydenburg, there are over a dozen small mines which should be producing 200 ozs. and upwards per month each; there will be another dozen producing from 50 to 150 ozs. each before the year is out. But we have no means of imparting this useful information to the investing public, because mine owners will not confide in them and tell them what they are doing. This district never will be recognised as a big gold producing area until the details of the gold outputs are announced regularly in these columns, and are reproduced in the other important far-reaching journals of South Africa." There is a sound constructive note about this criticism which we like, and, for our part, we cordially endorse our contemporary's appeal to the "small mine owner" to come out in the open and tell us what he is doing.

* * * *

Montrose Exploration.

The report of this company has just made its appearance, and is about as unsatisfactory a document as its predecessors. Mr. Frederick Walker, a director of several successful companies, has issued a circular strongly criticising the report, and submits that the best thing for the company to do is to liquidate. At his suggestion the meeting in London in mail week appointed a committee of shareholders to inquire into the position of the company. Mr. Walker declares that the only dividend the company distributed was illegal. He adds that he is one of the five largest shareholders.

* * * *

The Union's Collieries.

The effect of the industrial disorganisation of the month before last is not only marked in the case of the gold industry, but is particularly noticeable in regard to the collieries of the Union as well. Statistics published by the Chamber of Mines in respect of the January operations show a decline of just one hundred thousand tons in the coal outputs of the four Provinces as compared with December. The selling price per ton at pit's mouth was, however, higher all round, and the aggregate value of the production declined by not more than £15,223. The Transvaal sold 389,505 tons in January as against 468,931 tons in the preceding month, whilst the production of Natal declined from 231,110 tons to 204,070 tons. Orange Free State and Cape coal pits felt the upheaval in much lesser degree. The output of the former Province was actually higher at 17,073 tons, whilst the fluctuation in the Cape's output was unimportant. Of the sixty-three productive collieries of the Union 29 were situated in the Transvaal, and of these 29 the Middelburg area claimed 15 and yielded £67,011 out of a total of £88,388. The average selling value per ton at pit's mouth for all Transvaal coal was 4s. 6·46d., as compared with 4s. 4·5d. in December.

TOPICS OF THE WEEK.

THE GOVERNMENT AND THE LIFE OF THE RAND.

Though it may seem hardly fair to add to the embarrassment of the Government at this strenuous moment of an exhausting session, its extraordinary attitude towards the famous Chamber of Mines evidence regarding the life of the Rand cannot be allowed to pass unchallenged. This week, for the second time since the publication of that evidence, the Minister of Mines has announced, in effect, that he does not take seriously the disquieting statements made by the Chamber. There can be no mistaking the meaning of the Mininster, because twice the question has been put from opposite sides of the House—and twice the same answer has been vouchsafed in simple, unambiguous language. First, Mr. Grobler, the progressive member for Rustenburg, drew the attention of the Government to the evidence of the Chamber of Mines, and with unaffected concern invited an official statement in regard to its trustworthiness. The Minister of Mines, replying at some length, brushed aside the view of the Chamber and practically said he doubted its fairness and accuracy. We ourselves at first blush were disposed to regard it, and did actually describe it, as unduly pessimistic, unfortunately worded, and "a piece of special pleading." We still hold that the facts might have been better expressed, but we are as reluctant as ever to attempt to argue, in the absence of the data whereon the framers based their forecasts, that the estimate is not a fair one. Emboldened by our own doubts of its infallibility and the open refusal of the Government to recognise it as otherwise than outlandishly exaggerated, we started in to probe the matter more deeply. Arising out of our enquiry, a public-spirited member of the Assembly, Mr. Emile Nathan, the indefatigable representative of the urban interests of Von Brandis, put a number of questions to the Minister of Mines bearing directly on the subject. Thus, both town and country representatives united in impressing upon the Government the importance of the issues involved by the estimates of the Chamber of Mines. But Mr. Nathan was no more successful than Mr. Grobler, and he has to be content with the curt rejoinder of the Minister that the Government has no time for introducing ameliorative legislation this session, and that it has no time, either this or any other session, for amending the Gold Law in respect of prospecting. To accept, at this juncture, the fatuous *ipse dixit* of the Minister that he has "no time" for the industry would be nothing short of a counsel of despair. Plainly, the matter cannot be allowed to rest here. The facts must be faced—and they must be faced now! It cannot be denied that the evidence of the Chamber of Mines came as a shock to the "man in the street," to the large public that draws its living indirectly from the mining industry, to the oversea investor in industries anciliary to mining, and, according to Mr. Samuel Evans, to the youth of South Africa, whom it is alleged to have deterred from entering the field of mining engineering. Shareholders in mines on the Rand are intelligent enough to have acquainted themselves with the probable "lives" of their own particular mines, and to them perhaps least of all was the statement a surprise. But the farmer who looks to the Rand for his permanent market; the oversea merchant who sinks money in buildings and credit here; and the investor in our State, municipal, power, and water supply undertakings—surely something is due to them by way of explanation of the bewildering and perturbing Rand life estimate in question! As reasoning beings they know, without being told, that the Chamber of Mines did not entrust the preparation of its evidence to the office boy or the caretaker. As a fact, a committee of the most highly-paid, expert mining engineers connected with the industry framed that estimate, and it may be assumed that they did not put their names to anything they had not verified for themselves, and of whose absolute accuracy they were not entirely convinced. And against this what have we? Merely the airy and unsubstantiated assurance by the Minister, that he does not believe it. We can imagine Mr. Malan in all innocence referring the question to the Government Mining Engineer, Mr. Kotze, his expert adviser; and Mr. Kotze waving the whole thing aside as ridiculous. But is Mr. Malan or Mr. Kotze competent thus lightly to brush aside the reasoned and considered decision of the whole cream of the engineering talent of the Rand, equipped with access to all the facts? We submit that neither authority is so qualified, and that the onus is on them to investigate the data upon which the engineers framed their statement, and to adduce rebutting evidence other than mere rhetorical denunciation. The question, it cannot be too often reiterated, is one of vital importance to South Africa. Almost the whole framework of the Union is sinewed and supported by the revenue, mainly indirect, derived from the Rand. Yet can it be believed that when the Government and the country are told as plainly as words can convey that the productive capacity of the Rand, *under present conditions*, will be halved in sixteen years, the Minister more immediately responsible says he has "no time" to consider the matter. If there is any other question that could be of more vital concern to us—the ethics of "Mann-handling" not even excepted—we should like to hear of it. The fact is, neither the Government nor the Chamber can be congratulated on the whole business. The latter has gone to enormous trouble to prepare evidence on the life of the Rand that has apparently been ignored by the Economic Commission, to which it was presented; and further it has now tamely to submit to that evidence being brushed aside by the Minister of Mines. The Government, on the other hand, appears to be displaying an apathetic and lackadaisical spirit and adopting a callous and almost criminally negligent attitude in regard to a question that strikes at the very foundation of the credit of the Union.

THE REORGANIZATION OF NATIVE LABOUR ON THE MINES.

Of the many attempts which the Rand mining industry has made to reform itself none has given such evidence of thoroughness and sincerity as that now in progress. Naturally, to the whole question of native labour much thought and study is being devoted, and we expect to hear in the very near future that the reorganization of the coloured labour supply on the mines of the Rand has been radically altered—indeed improved out of recognition. The evidence given by leading representatives of the industry before the Economic Commission showed the direction in which men's minds were—not a moment too soon—moving, and in our columns a few weeks ago a leading consulting engineer spoke enthusiastically of the prospects of economy that lay in this direction. For further light and leading on the subject, naturally one turns to the report of the Economic Commission, which, its severest critics cannot deny, was peculiarly well fitted to deal with this particular phase of mine labour. Unfortunately, the discursive nature of that report does not facilitate the deduction of one consistent co-ordinated policy of reform, and it is necessary for the seeker after knowledge to piece together various scattered and disjointed passages in the report that, combined, may be said to form a constructive programme of real value to the industry. That programme may conveniently be divided up and described under the following heads:—(1) The introduction of a system of piece rates for the payment of native workers; (2) the elimination of the colour bar in mine work; (3) the transference of the organization of native labour underground from the contractor, who is without any special organizing ability, to a white overseer employed by the mine, who has that ability; and (4) the adoption of a system of providing locations on or near the Rand, to which natives can bring their families. In regard to the first three of these, the Commissioners are unanimously of the opinion summarized by us, but in the case of the fourth, in view of the "grave issue involved the Commissioners are not prepared to make any recommendation"—though they set out the advantages of the system very plainly, and content themselves with adding that there are certain countervailing disadvantages. To take the four recommendations in detail, we find that the report devotes chief attention to (1) paying the native on piecework. The Commissioners feel no doubt that the productive powers of the native are being held in check while at the same time a sense of injury is being generated by the device of the maximum average in particular, and in general by a failure on the part of the gold mines to pay natives more frequently on a system which furnishes an incentive. To the system of piece rates for white workers there may not infrequently be objections, but these objections do not carry the same weight in the case of the native. He is in that stage of industrial development in which " the crude incentive of gain " is an important, if not indispensable, educational instrument. Moreover, it should be noted that any possible ill-effects of extra exertion are neutralized by the long interval of rest, or change of employment, which he enjoys when he returns to his kraal after a spell of work for the white man. The native desires to be paid according to his strength; and he complains of the small amount he earns. The Commissioners understand that the question of an extension of piecework for natives is closely engaging the attention of the gold mining industry, and are convinced that much can be done in this direction to increase the efficiency of native labour. They agree with Mr. Taberer, who stated that he preferred piecework (for natives) in the interest of the mine, of the native, and of the industry. Mr. Taberer said:—

> " There is only one suggestion to make, and that is to recognise the native as a worker and pay him wherever possible according to his capacity . . . . they have had a very excellent example of how easy it is to defy the law and order, and that has pushed their minds ten or fifteen years ahead in the knowledge of how to get the things they want. . . . I think the mine natives on day's pay do not, naturally, over-exert themselves, provided they do sufficient to justify its being marked on their tickets. That is about all you may get out of them. If you pay them according to their capacity, I think you will get very much better work out of them, and therefore you will be able to do with fewer natives."

This being the position, the Commissioners trust that the whole question of wages and work given to the native labourer will be approached in " a liberal reforming spirit." In regard to (2) the removal of the colour bar—closely bound up with (1)—the arguments in its favour are familiar to our readers; and of the often reiterated opinions of the Commissioners in favour of the change as beneficial to both white and black, it will suffice here to quote the following:—

> " Just as the white man would be damaged by the suppression of natives as unskilled aids in production, so he must be damaged in the long run by the operation of all influences which retard their improvement in application and competency. The development of the native labour force may mean economizing in white labour in some directions, but it must mean increased demand for it in other directions. Ultimately the employment of supervisors must depend upon the amount of profitable work that can be done by the native labourer. Moreover, the better calibre of the native, the higher is the plane of work of the supervising white, and the greater is his value. Your Commissioners are convinced that in the long run any attempt to keep down the native to sheer unintelligent exertion is bound to recoil on its promoters."

Of slightly more novelty is recommendation (3). It crops up in that portion of the report dealing with the contract versus day's pay system of remunerating the white miner. The idea was expressed to the Commissioners in evidence from several quarters that, from the point of view of the management, the contract system is defective in placing too much responsibility for organization on men who have received no training in it. If their organization is imperfect they lose, it is true, but the management loses also, because the means of production are not being put to the best use, and the management may feel compelled to make up some of their losses to them, who naturally think that the fault is not theirs. This placing of responsibility on the men for organization may explain a statement made by one witness who had experience of mining in America. He declared that on the surface the efficiency of the Witwatersrand mines was outstanding, but that underground it fell far short of the ideal, and compared unfavourably with other places. This partial delegation of organizing also creates trouble when some of a miner's boys are taken from him and new hands are put in their place. The fact is that the miner is not the proper person to be saddled with the responsibility of organizing native labour underground. If the selection of labour and the weeding out of inefficients is to be successfully practised, and the available native labour supply is to be turned to best use, the mine management must do the work itself. This is emphasized in another part of the report. There it says:—

> " But it should be pointed out that cheap labour may be dear through want of capacity or want of will, and that the latter is often overlooked. Wages are the incentive to work and must be adequate to produce it. Referring to the present use of native labour a witness said: ' Native labour in South Africa is so cheap that it has come to be looked upon as a thing which can be used extravagantly.' Your Commissioners share this view, and are of opinion that insufficient attention has been given to the organization of native labour, upon which industrial prosperity in South Africa so largely depends."

Lastly, the question of native locations near the Rand merits consideration. As far back as 1907, in a series of articles entitled " The Salvation of the Rand," this paper advocated the introduction of that system with other labour reforms. The Commissioners point out that the system of providing locations to which natives can bring their families is found chiefly on the coal mines, both in Natal and in the Transvaal. On the gold mines it has only been adopted to a small extent. It is not applicable to diamond mines. The evidence as to its steadying effect upon the coal mine labour supply is clear. With reference to the Transvaal, Mr. R. N. Kotze, the Government Mining Engineer, said:—

> " The man on the gold mine remains for eight or nine months probably, but the average duration of stay on the coal mines is much longer. The coal mine is generally on a privately owned farm where there is plenty of land, and the company permits these boys to put up huts outside the compound, and sometimes away from the compound, and there they live in these huts with their families and cultivate a little patch of ground round their dwellings. They become permanent residents on the mine, and they never go away." Another witness stated: " We have over 200 married quarters . . . married natives as a rule are steadier workers: like white men, they are generally the best workers of the lot." Asked whether his experience was that the provision of these quarters for married natives helps the mines, the witness said " yes." In connection with gold mines, Mr. Taberer, of the Native Recruiting Corporation, when asked whether there was a strongly expressed wish among the natives to bring their people to the mines, said: " It is not only a strongly expressed wish, it is a growing wish, especially now. You will understand that in most parts of the country they have lost their cattle through diseases . . . and they say ' Having lost my cattle there is no tie to keep me here. My home is my work, and I should like to have my wife and children with me at my work."

The Commissioners, it is regrettable to note, lacked the courage of their convictions, and failed to make any recommendation in this important regard. None the less we look to see the system largely extended on the Rand, as part of the larger policy of reorganization of the native labour supply. The foregoing, we submit, taken as a whole, offers itself as a plain, commonsense programme of reform in native labour reorganization on the mines that promises to secure to the industry benefits of an immediate and lasting nature. In its entirety its adoption, of course, is not practicable without the sanction and co-operation of the Government. But the effect is bound to be so far-reaching and so fraught with favourable influence on the credit and prosperity of the industry and the country that it is inconceivable that any Government could long stand in the way of such reasonable and overdue reforms.

International Congress of Mining.

One of the largest of the great scientific and industrial congresses is to be held in London in the early part of June, 1915. This is the sixth international congress of mining, metallurgy, applied mechanics, and practical geology. These congresses take place at intervals of five years, and the last, which was brilliantly successful, was held at Düsseldorf in 1910, previous congresses having been held in Paris and Liége. The attendance at the Düsseldorf congress was more than 2,000, and it is anticipated that the attendance in London in 1915 will be equally large. An influential committee has been formed to make the necessary arrangements, and the movement is being actively supported by the University of London, Imperial College of Science and Technology, Geological Society of London, Institution of Mechanical Engineers, Iron and Steel Institute, Society of Chemical Industry, Institution of Mining Engineers, Institution of Mining and Metallurgy, Institute of Metals, South Wales Institute of Engineers, Cleveland Institution of Mining Engineers, West of Scotland Iron and Steel Institute, Staffordshire Iron and Steel Institute, Sheffield Society of Engineers and Metallurgists, and by numerous firms interested in the various industries represented.

What is Wrong with South African Mining?---V.

More Representative Views—Consulting Engineers Favour State Boring—Mr. W. W. Mein on Prospecting—Strong Views on Inefficiency Underground.

In view of the numerous fears regarding the decline of mining on the Rand expressed in several influential quarters of late, and, further, of the growing popular belief that mining in South Africa is rapidly deteriorating, and prospecting losing its attractions, we have invited for publication the views of leading engineers and mining men on the following questions:—In Regard to the Rand: (a) *Do you think it would pay the Government to prolong the life of the fields by reducing indirect taxation?* (b) *Should the Government help the industry by direct financial assistance or scientific research work in the form of the Mines' Trials Committee or some similar body?* (c) *By using its influence in the sphere of unskilled labour, can the Government do anything to prolong the life of the industry?* (d) *Can you suggest any other way by which the Government can help to attract capital, open up dormant mining areas and so to prolong the life of the industry?* (e) *Do you forsee any opening for further reduction in working costs, and if so, in what direction? In Regard to the Rest of the Union and New Discoveries:* (a) *Do you consider the Government should encourage prospectors and "small men" by:* (1) *Reducing or abolishing claim licences?* (2) *Throwing open all farms to prospectors, with due safeguards?* (3) *Foregoing transfer fees?* (4) *Direct financial assistance?* (5) *Waiving mining regulations?* (6) *Or in any other way? And, generally, would you favour a Government Commission to enquire into the foregoing?*

THE following is a further selection of representative views received in reply to the above questions:—

ANOTHER CONSULTING ENGINEER'S OPINIONS.

A consulting engineer writes:—"The Government, of course, must have revenue, so I do not see how it can reduce the taxation of the Rand mining industry. In regard to native labour, even if you do remove the colour bar, it may take years to train sufficient natives to effect any substantial economy. As for the Government subsidising research work such as that of the Mines Trials Committee, I fear the present producing mines cannot benefit much therefrom. The reason is that even if a new device be discovered, the capital cost of installation may prove too great for a short-lived mine to embark upon. The only direct way I can suggest for the Government to aid mining would be for it to pay the cost of all the boring for new and extensions of old reefs that remains to be done in the country. The work should, of course, be carried out under the direction of the Geological Survey, and big results might accrue therefrom. In regard to the outside districts I think that all your suggestions should be adopted, and a Commission to go into all the questions raised is most certainly desirable."

VIEWS OF MR. ALFRED LEWIS.

Mr. Alfred Lewis writes:—(a) Not much; reduce all the men and offices not connected with the mines, and work the mines from the mines, and not from town offices; also reduce the directors to about three experienced men, and not have a dozen hanging on, as in the case of the Wolhuter; that mine can be worked by a less number, and is as easy to handle as a colliery. (b) Yes, and establish Government mills on the outside fields; this will enable miners to work claims at a profit and create a demand for those areas, which will yield handsome wages under such a scheme. (c) Yes, if white labour is meant, as a white man is doing the work (in Westralia) of 4½ niggers, and the Victorian costs—under our conditions—are 20 per cent. under the Rand. (d) Yes, by appointing an expert on each company to create confidence. (2) Throw open all unworked areas, and allow anybody to work them (that can do so), free of licence for a few years, and as per my points in (a), (b), (c) and (d). (e) Yes, by making the minimum tonnages crushed equal to one million tons yearly each mine (where this is possible); by reducing or cutting down the 6d. to 1s. 6d. per ton that is paid out for luxuries and useless expenditure. By bringing in 200,000 Chinamen, under proper control, giving them 40s. a month, plus food, and a bonus, with increased white supervisors to look after them. In regard to the rest of the Union, there are 90 billion tons of banket, outside of the Rand, that will yet be milled at a profit, if the Government will waive licences. Throw open farms to free prospecting to *be worked*, and *not dummied*, and waive all other regulations, then 3 dwt. ore will pay. The writer worked a portion of the Princess Estate at 11s. over 20 years ago, and has just worked out a tribute at 6s. ton costs, under conditions suggested herein. A Government Commission should do a lot of good, especially if it is composed of practical men.

MR. W. W. MEIN AND PROSPECTING.

Mr. W. W. Mein, who is well known locally and who was one of the consulting engineers of the Corner House a few years ago, expressed some interesting views on the subject of prospecting in the issue of the *Mining and Scientific Press* to hand by this mail. He writes:—

> Money is available to support prospecting, and prospectors are available for the work, just as long and as plentifully as results prove favourable. The only factor required to stimulate enterprise is success, and the present phase of comparative inactivity is due to lack of recent finds of great importance. The area of unknown territory is constantly decreasing. Further, when prospecting is most active, it is generally the most wasteful and poorly directed. The natural laws governing the situation lend themselves little to control by artificial measures. The practical utility of government aid to prospectors is largely a matter of historical and physiographical conditions. In a little developed, heavily timbered, and mountainous country like British Columbia, the prime function of the Government toward prospecting should be in the improvement of roads and trails, as is creditably recognized by the provincial authorities; in California, the most valuable work of the state lies in the collection and distribution of accurate knowledge, so that past experience can best be applied in the search for new occurrences; in a desert country like Arizona, where the outcrops are usually less obscured, the most direct aid to prospectors might lie in the loan of State drills, as in Western Australia and Nova Scotia. Broadly, I feel conservative in my views of governmental relations to the speculative industry of mineral exploration. Fearing the danger of faddist legislation more than the effects of undue indifference. I prefer to see official energies confined, almost exclusively, to the geological surveying, statistical and publicity work, and the fundamental duty of improving the accessibility of difficult regions.

Mr. Mein's views have obvious application to different portions of South Africa in regard to the question of Government assistance.

Mr. Alf. Hellawell writes:—

> Most people are smiling at the affectation of pessimism in the evidence placed before the Economic Commission on behalf of the Chamber of Mines! Since the War mining policy has been a series of somersaults in opportunism, and the Chamber of Mines has to bear its share of the blame to be apportioned for the present unsatisfactory condition of the Mining Industry. Many people hesitate to accept the Chamber's diagnosis of the diseases affecting the Industry, or, without considerable reservation, its prescriptions for a cure. There has been a constant appeal from the Leaders of the Industry for more settled labour conditions as the chief factor towards lower working costs. There are few evidences of a permanent practical policy likely to attain either result. The manager and the miner have been in a state of more or less passive antagonism most of the time—the chief loser has been the shareholder. We have now reached a crisis—neither party trusts the other, and the mining outlook can hardly be termed bright. Nor do I agreed with those who ascribe the unsatisfactory scale of working costs to the periodical shortage of native labour troubles. That a fluctuating native labour force has caused managers considerable handicap is beyond question, but that trouble has never been a determining factor. Much has been spoken and written upon the question, in considerable detail, during many years past. But very little practical progress has been achieved towards the real end all are striving for, i.e., *cheaper working costs that will give increased profits*!
>
> Amongst the many means to that end we have had put before us various so-called governing factors, according to the point of view of the specialists. The following summary of factors that were designed to lessen working costs is worthy of recapitulation:—
>
> 1. More native labour; (2) Improved machine drills; (3) Better air pressure; (4) Electric power; (5) Reduction of miner's wages; (6) Improved ventilation; (7) Better class of shift boss; (8) Labour-saving

machinery; (9) Cleaner sorting; (10) Elimination of sorting; (11) Bigger crushing plants; (12) Amalgamations; (13) Central administration.

One could add to the list other factors supposed to make for lesser working costs. Yet in spite of an enormous capital expenditure, spread over the past five to ten years in improving the mechanical and labour-saving lay-out of the mines, the number of natives employed per ton broken, mined, and milled is higher than ever it has been! It looks as if labour-saving devices have required more labour to manipulate than the work itself called for before labour-saving devices were introduced! The more capital the Industry swallows the less dividend the investor gets!

The one broad outstanding fact is that in spite of our enormous supply of cheap, unskilled labour, and the spending of millions on improved machinery, the profit per ton, per month, and per £1 of capital invested, is on the down-grade. There are so many factors in the problem—the big question of grade for instance—that it becomes a matter of extreme difficulty to set out a plain solution that will find general acceptance. The demand for lower working costs has drawn all sorts of responses from mine managers and consulting engineers. But the cost per ton fetish has had its day, profit per ton and the bigger number of profitable tons possible is now demanded, and having no ready reply to this insistant demand, the Chamber of Mines, as apologists for the Industry, have switched off into futures!

Speaking as a practical man, unencumbered with dogmas of high mining finance, I claim there is no good and sufficient reason why gold mining should not be carried on with a large margin of profit for shareholders, without encroachment on the rates of pay of any class of workmen on the mines. The mills of the Rand are not crushing within 25 per cent. of their capacity. Yet we are told there are too many white men employed. I know this statement is qualified by the ratio of natives to white man bogey. I claim that most of our troubles are due to the lack of a defined standard of efficiency amongst both white supervisers and black workers. Both white and black workers have been forced into a groove of inefficiency. Neither are encouraged to give of their best. All are more or less forced into passive drudgery until they get fed up and get out, or muster up pluck to protest and get fired out. Miners are charged with migratory habits—the average period of employment is only a few months. The cause may be the unsatisfactory quality of the workman, but it is also possible that working conditions are not attractive enough to keep good men!

As is well-known, miners as a class are after big cheques, and will put up with all sorts of danger and unhealthy conditions to get that cheque. If mine managements have failed to get a quid pro quo for the cheque, theirs is the blame. A developer doesn't get 35s. a foot because it is a fair working price. If he could be kept clean all the time, get plenty of steel at the right time, sufficient air, and his boys regularly at work, he could make a satisfactory cheque at 27s. 6d. a foot. (My prices are merely for comparative illustration.) He is paid the extra 7s. 6d. a foot to counter-balance the absence of mine organisation. A man may be doing 70 to 80 feet a month, who could possibly do 100 to 120 feet a month if he were supported by mine organisation. We must not hide our heads by laying blame on the individual miner or manager; the system is wrong and is to blame for poor results.

The machine stoper does not give us efficient results for the same reason the developer fails. In the majority of mines, even if he has ample steel and air he can only "come out," while his machines are well down the stopes. When he has to go up the stope for benches, his stope is blocked with broken ground (and the mill may be hung up for ore), and he can only rig up, after his boys have done a couple of hours lashing to clear benches.

The trammer cannot give his best because of a general lack of facilities for handling rock cheaply and efficiently. Blue prints show that 2 to 2¼ tons per boy employed is the average efficiency from stopes—and that is unsorted ore! As a rule tracks are poor, trucks more or less out of running condition; stope boxes in bad condition or poorly devised; shovels ungettable; bosses often unreasonable; light unsufficient; and thus the poor results attained.

Timbermen and pipe fitters are constantly held up for want of tools or material, and in far too many mines there is no organised scheme of work, and the men are often wasting time wandering more or less aimlessly about the mine looking for jobs, and dodging the shift bosses. The 36 inch and 42 inch task of the hammer boy and the 4 to 6 hole shift of the machine boy are bug-bears underground. Why should a boy come up at midday because he has got his 6 or 7 hand hole in? It is one of the absurd grooves underground work has got into.

Efficiency comparisons underground are nearly always made on a cost per ton basis. The result is that we cannot make fair comparisons of present-day costs with those of, say, 6 years ago, because of the fluctuating cost of native labour and supplies. A "tons per boy" figure is the soundest basis of efficiency, and can be expressed in more or less reliable terms. It would be necessary to note that different classes of mines will always produce different factors. For instance, the efficiency per boy factors on two such distinct types of mines as, say, the Knights Deep and Bantjes, will not lend themselves to comparison. But a very short study of the conditions of any one mine will enable us to formulate a standard of efficiency that can be expected, and then insisted upon!

None know better than mine managers that underground efficiency is a long way below the attainable. Their underground staffs may be most loyal and ambitious; their contracting miners may be after big cheques; their day's pay men of good quality and not careless about their jobs; and yet they seem unable to achieve the result they know to be possible. As I have always said, the fault lies in methods—we are in a groove, the only remedy we have for idle stamps is an over-whelming force of native labour! To sum up: bad working conditions defeat the keenest men the Industry can atttract underground—and brute force is no argument!

THE YEAR WITH THE RANDFONTEIN—LANGLAAGTE GROUP.

Some Important Facts Concerning Rock Drills—Extensive Development and New Reefs at Randfontein—Old "Estate" Mine at Langlaagte Approaching Exhaustion.

Mr. J. H. Crosby, the new chairman of the Randfontein-Langlaagte group, had some interesting facts and figures to give shareholders in the Randfontein and Langlaagte Estate Companies at the annual meetings held on Monday last, and if his speeches contained references to no very startlingly new developments, they at the least offer much food for reflection. Mr. Crosby's remarks will, too, interest a larger circle of people involved in mining enterprises who are not shareholders. For instance, his statements in reference to the employment of rock drills at Randfontein (which are printed in full elsewhere in this issue) should be read, marked and learned by manufacturers of mining machinery the world over. Operations at Randfontein were much hampered during the second half of the year by the shortage of native labour. The natives in the company's employ at June 30 and December 31 numbered respectively 24,383 and 18,578. In consequence, the company was only able to mill 1,164,156 tons during the second half, for a profit of £135,270, as against 1,368,887 tons during the first half, for a profit of £185,864. Strenuous efforts were made to deal with the position, and rock-drills were used wherever possible. No very good results were achieved, however, and the company is still on the look-out for a suitable machine. Notwithstanding the July strike and its disastrous after-effects in regard to native labour shortage, a very large amount of development work was undertaken last year, and 2,196 feet of shaft-sinking, 89,433 feet of driving, rising and winzing, and 498,277 cubic feet of ore bins, sumps, stations, etc., were accomplished. The ore reserves at the end of the year amounted to 8,635,610 tons, of which 6,818,929 tons give average assay values of 6·5 dwts., or 27s. 7·3d. per ton. These figures compare with 1,423 feet of shaft-sinking, 80,012 linear feet, and 321,771 cubic feet in the previous year. An increase in the quantity of the ore in reserve is to be noted, but this has been attended by a small diminution in value. At the end of 1912 ore reserves amounted to 7,600,000 tons, of which 6,350,781 tons were valued at 6·8 dwts., equal to 28s. 10·6d. per ton. Despite the disappointment in regard to profit-earning in the latter part of the year, 1913 when considered from all points of view, must be accounted a satisfactory year at Randfontein, particularly so in regard to development. Randfontein is unlike any other proposition on the Witwatersrand, in that new reefs appear to be continually coming to light there. On this point the chairman's remarks, printed elsewhere in this issue, are of interest. As to the Langlaagte Estate, a decline in tonnage milled, in revenue and in profit (total fall, £23,662) were recorded. Efforts to overcome "unfavourable factors" were successful to the extent that working costs were decreased by £34,777, or 8·38d. per ton milled. The drop in revenue of nearly 1s. 4d. per ton is attributable to the poorer grade obtained from the estate section, which is nearing the end of its life, and an appreciable improvement will in all probability be shown when the estate section is finally worked out and the Block "B" section is supplying the whole of the requirements of the mill. Development was vigorously pushed ahead and was dealt with at some length by the chairman.

FRENCH FOREIGN BONDHOLDERS AND RAND COMPANIES.

Attitude in Regard to the Robinson-Crown Mines Amalgamation.

A FACT of general interest brought out by the agitation conducted by Mr. Aubrey Hyman in Paris against the proposed Robinson-Crown Mines amalgamation is that the old French "Council of Foreign Bondholders," bearing the title of the "Association Nationale des Porteurs Français de Valeurs Etrangères," is now apparently absorbed by the "Office National des Valeurs Mobilières." The Office National has now published a communiqué in the Paris Press which gives an insight into the attitude adopted by it in the matter of the recent agitation:—"The Office National des Valeurs Mobilières had been solicited several times and from several quarters to intervene in the questions concerning the Robinson Gold. When the question arose of the amalgamation proposed between this mine and the Crown Mines, the General Council of the Office National did not consider it right to intervene between shareholders in order to express its opinion upon a scheme which they were called to pronounce upon at a general meeting. Now that this proposal has been withdrawn, it has considered it right to persevere in its abstention. The shareholders appear to be divided into two groups, one of which follows the lead of the retiring directors, and the other that of the personage who has conducted the campaign against the amalgamation scheme. Both the one and the other will be free to give their vote at the coming general meeting, whose decisions, as voiced by the majority there, will make the law for all. During the last few days it has been said and repeated by many newspapers that the Association Nationale des Porteurs Français de Valeurs Etrangères, since the Office National des Valeurs Mobilières, had made M. Robellaz enter the governing bodies of the Robinson Gold and the Crown Mines with a mandate to represent French interests. This statement is inexact. The Association Nationale had only to do with the East Rand in consequence of the difficulties which had arisen there. . . . It confined itself to that, and, although it knew that M. Robellaz had found a place upon other Boards, it had no occasion to delegate to him outside the East Rand a mandate of representation which it had not itself solicited from the parties interested. . . ."

BARNATO GROUP SUBSIDIARIES.

Position at Various Mines—Progress of Construction at the Government Areas—Van Ryn Deep's Excellent Prospects—Bright Outlook for the Consolidated Langlaagte and Knights.

LAST month the mines of the Barnato group increased their aggregate profit, despite the lesser running time than in the preceding month. The February profit was £94,055 and that for January £87,277. The total profit earned by the mines of this group has shown a steady increase month after month for the past year and a half or more. There have been occasional setbacks as the result of strikes or short running time periods, but generally speaking the progressive advance has been remarkably well maintained. The prospect, too, is that there will be further advance. One or two of the older outcrop mines are likely to show declining returns in the near future—the New Primrose, which has been a remarkably fine property, but which obviously cannot last for ever, for example. However, despite this it seems clear that with the aid of the Van Ryn Deep, the Consolidated Langlaagte, the Knights, and next year the State Mines, there will be further substantial augmentation of the monthly earnings. At this juncture a brief flying survey of the mines of this group may be of interest.

The State Mines.

At the Modderfontein Government Gold Mining Areas property the preliminary details of construction work are now practically completed. The principal excavations are finished and the mortar blocks for the mill are in. Excavations for the cyanide tanks are completed and some of the tanks are arriving. Unless any eventuality at present quite unforeseen occurs the plant, which will in the first instance have a capacity of 50,000 tons per day, should be easily ready by the end of the year. As to the underground position it is satisfactory to learn that lately there has been an improvement all round in development faces from each of the four shafts. Hitherto little work has been carried out from the south-west shaft, but lately a fair amount of driving, etc., has been done here, and the values are good. It may be remembered that the shaft itself penetrated a poor zone, and it is therefore most satisfactory to learn that away from this shaft results are very much better. Altogether it looks as if the Modder State Mines may yet prove itself to be a much more profitable mine than the majority of people seem to anticipate.

Van Ryn Deep.

The Van Ryn Deep continues to open up in a manner which marks this property as being one of the best gold propositions in the world. Development at all points is good and although there is as yet no question of increasing equipment it can be expected with confidence that there will be a steady improvement in returns for some little time to come, more particularly in regard to profits. Working costs last month were at the rate of 18s. 4d. per ton, and the management hope to reduce these materially during the next month or two.

The Witwatersrand.

An improvement in the labour supply at the Knights, or Witwatersrand, mine induced the management some little while ago to re-open the new vertical shaft located on the southern section or T piece of the property. The shaft has been dewatered and sinking is again proceeding. The results are excellent, and it is certain that the life of the Knights Company will be very materially prolonged and the aggregate dividend record much bettered by development of this southern section. The new tube mill plant is working very well, and the value of the residues has been reduced to a creditably low figure.

New Rietfontein Estate.

The New Rietfontein, with its thin and erratic reef, is at present the black sheep of the Barnato family, and here the scale of operations has been cut down to a basis of 6,000 tons milled per month. It is impossible at this juncture in the company's history to say anything definite as to future prospects as everything is at present in a transition stage.

Consolidated Langlaagte.

At the Consolidated Langlaagte prospects are very good. On the bottom level the reef values and widths are quite satisfactory, and the general outlook is excellent. The new plant continues to render excellent service.

Other Mines.

At the other mines of the group, New Unified, Glencairn, and New Primrose, the position remains unchanged. At some properties native labour is short, at others the position in this regard leaves little to be desired. Taken on the whole, the subsidiaries of Johannesburg Consolidated Investment Company are undoubtedly in a very sound position.

THE EAST RAND PROPRIETARY REPORT.

Development Figures Analysed—Reasons for the Contraction—Labour Shortage and a Cautious Forecast for the Year.

WHAT will chiefly interest the majority of readers of the annual report of the East Rand Proprietary Mines is, without doubt, that portion which relates to ore reserves. At the end of December last the payable ore reserves standing developed in the mine were estimated at 5,600,000 tons of an average assay value of 6·7 dwts. over 54 inches. It will be thus obvious that the East Rand Proprietary is still in a strong development position. The ore received from the various mines last year was 1,935,991 tons, so that the developed reserves are nearly three years ahead of milling requirements. Moreover, there is accumulated in the mine a very large quantity of ore—over eight and a-half million tons, which is of a value of less than the present pay limit of 4·3 dwts. Much of this ore would be of profitable value if any sensible reduction of working costs were effected. But despite the strength revealed in these figures the development position is by no means as satisfactory as might have been hoped for. Of course, in large measure this is due to necessarily restricted development operations. As the superintending engineer puts it:—

The development accomplished during the year was 56.601 linear feet, and 486,486 cubic feet of sundry excavations, which is slightly less than that for 1912. This footage, however, is considerably short of what is necessary to maintain the ore reserve in a sound position, but the substantial financial provision available will permit of rapidly extending development, when underground conditions permit. The chief contributory causes to the restriction of development have been the delay on the part of the manufacturers in the delivery of the pumping plant, the further interruption to the installation of the pumps, owing to compulsory stoppage of pumping during the strike, and finally, the acute labour shortage during the last six months.

As it is, the payable reserves at the end of December last were 400,000 tons less than twelve months previously. With regard to the value of the year's development, it is important to note that:—

The tonnage developed during the year amounted to 1.530.226 tons, of which 904.046 tons or 59 per cent. was payable of an average value of 6.9 dwts. The percentage of payability is slightly higher than last year, but the average value is appreciably lower. The reduction in value is accounted for principally by the larger proportion of development having had to be carried out in the Cason or poorer section of your property. The footage of drives at this section alone amounted to 13.975 feet, out of a total of 30,562 feet for all the sections. Further, the total driving in the two mines of the western and richer section amounted to only 7,940 feet, as against 14,208 feet last year. This was unavoidable on account of the near approach to the water-bearing dyke.

The company contemplates extensive development operations during the current year. The Hercules section will be opened up by crosscuts from the 23rd to the 31st levels, the east incline at the Angelo Deep will be continued, and it is proposed to continue the Farrar secondary shaft in the western section. This year's results will, of course, be largely determined by the native labour position. In this respect the superintending engineer, in concluding his report, significantly remarks:—"The prospects of securing increased development and of maintaining the satisfactory profits of last year depend largely on a considerable improvement in the existing labour position, without which the results for the ensuing year will not equal those for the period under review." Mr. E. C. J. Meyer, the manager, in his report, adds considerable further information on the subject of ore reserves. It is of interest to note the development results obtained in the different sections of the property during the year. These are shown to be as follows:—

The estimated tonnage of ore developed during the year amounted to 1,530.226 tons, segregated as follows:—

	Payable.	Unpayable.	Total.
Driefontein...	188,116	46.807	234,923
Angelo	206,509	42.707	249,216
Comet	220.920	181,601	402,521
Cason	265,265	307,326	572,591
Angelo Deep	16,380	46,867	63,247
Hercules	6,856	872	7,728
Totals	904.046	626,130	1,530,226

Ore Reserve.—The payable ore reserve at the end of the year stood as follows:—Driefontein, 1,512.530 tons; Angelo, 1.355.993 tons; Comet, 1,282.367 tons; Cason, 1,154,472 tons; Blue Sky, 29,465 tons; Angelo Deep and Hercules, 265,173; total, 5,600,000 tons.

It will be observed that the tonnages of pay ore so far opened up in the deep level sections—Angelo Deep and Hercules—are small, but this year it is intended to prosecute work much more vigorously in these important areas. Doubtless, at the forthcoming general meeting light will be thrown on the all-important question of the value of ore developed in the year in relation to the grade of ore crushed.

Sub Nigel.

The Sub Nigel mine has been much in the limelight of public interest of late, and as we announced a week or two ago it has been decided to enlarge the company's milling equipment at an early date. The position in regard to recent developments is, briefly, as follows:—

In order to locate the longitudinal dyke intersected in "D" shaft, a borehole was put in on the 14th level in "B" shaft at a point 90 ft. west of the line of "C" shaft. This borehole has now been advanced 500 ft. without encountering the dyke, thus affording evidence that the direction of this dyke, as shown in "D" shaft, is not continued. It would therefore appear that on the outcrop side of the dyke there is a considerably larger claim area than could be calculated upon from the evidence previously available, and that "C" incline shaft might be continued to the neighbourhood of the boundary of the property before encountering this dyke. The directors have therefore authorised the sinking of "C" incline shaft to be continued with the object of making that shaft the principal hauling shaft of the eastern portion of the mine, and which, owing to its position, will enable ore from "B," "C" and "D" shaft sections to be delivered to the mill without surface haulage. On the western section of the mine, the west drive from the bottom of "E" incline shaft has been advanced a distance of 430 ft., the first 310 ft. of which disclosed reef of low grade, and the last 120 ft. gave an average reef value of 13.2 dwts. over 23.7 inches. At the same time the east drive from the bottom of the same shaft ("E") was advanced for a distance of 415 ft., which disclosed in the first 350 ft. unprofitable reef, but in the last 65 ft. the reef exposed averaged 15.5 dwts. over 13.4 ins. This evidence of the existence of payable ore in the large western section of this mine offers encouragement to proceed with development work, and the same is being undertaken as circumstances permit.

MINING MEN AND MATTERS.

A farewell dinner to Mr. S. C. Thomson is being given at the Carlton Hotel to-night.

* * * *

A parcel of diamonds found by two diggers working claims on the Droogveld estate, and representing less than three months' operations, was offered to buyers last week-end, and an offer of over £12,000 was refused.

* * * *

A citizens' dinner, in the organisation of which the various local bodies are being invited to co-operate, is to be given on the Rand in honour of Viscount Gladstone, before His Excellency's departure from South Africa in June.

* * * *

Mr. Edward J. Way announces that his agreement as consulting engineer in South Africa for the Anglo-French Exploration Company, Ltd., having terminated he will engage in professional work, specializing as consulting and advisory engineer in the valuation and working of mines, their opening up, general equipment and management. He is prepared to deal with engineering disputes and arbitration and general mine reporting work. His offices are at Cullinan Buildings.

CERTIFICATES OF COMPETENCE.

Suggested Scheme for Mine Officials—A Plea for Financial Assistance.

[*Contributed.*]

THERE are few questions of greater importance to South Africa to-day than the provision of adequate educational facilities for its people. It is a subject which the recent Economic Commission touched upon, and on which Mr. Evans and Mr. Schumacher enlarged at the recent distribution of prizes to the evening students at the School of Mines. In the course of his interesting address Mr. Evans remarked, *inter alia*:—" All the positions worth having on the mines to-day require the solid foundation of a thorough primary and general education, and a great deal of technical knowledge. It seems to me that we should aim at establishing a state of affairs here whereby the road to the top is open to every boy who goes to work on a mine or in any other business. Every boy must have an education that will give him a fair chance. If this is to be accomplished we must press for and insist on higher educational standards. It is hardly necessary for me to point out that the opportunities here for learning practical mining are unsurpassed, and we ought to be educating mine managers for the gold mines of the world. There is no other place where an equal opportunity of training in practical gold mining can be got." Mr. Evans gave it as his opinion that the school was not getting as many students as it ought, and said it had been suggested that the fear of miners' phthisis was the cause. On this point he quoted authorities to the effect that the improvement in underground conditions had been so marked that there was now little to fear from dust. He announced that though the progress of the school had been slower than we could have wished, still it was progressing and not stagnating, and that further accommodation might have to be provided. That an extension of accommodation is needed is gratifying, though we infer it is not so much to meet the requirements of diploma students as for the large and increasing number of apprentices among whom the school is doing such good work. As regards diploma students, we gather from Mr. Evans' remarks that notwithstanding the very numerous prizes, scholarships and bursaries, the facilities offered by the school are not being taken advantage of and no material advance is being made. There is, we note, a pleasing increase in the engineering students, but in the mining department the number of students would appear to be disconcertingly small. This is very discouraging, and we hope is but a temporary eclipse, for we agree with Mr. Evans that the School of Mines, because of its great natural advantages—situated as it is in the heart of the world's greatest gold field—should be one of the most flourishing institutions of its kind and ought to be educating managers for the world. However, we look forward hopefully to the future of the school under the able guidance of Dr. Corstorphine. But whilst money is being unstintingly spent in providing education for the younger generation—an expenditure which apparently is not fully appreciated by those for whose benefit it is intended—it appears to us that the claims of another and important phase of education is being unwittingly overlooked—we refer to the provision of suitable classes to bring mine officials up to the standard required for Government certificates of competency. These excellent examinations are probably among the highest standard of their kind, calling for a wide knowledge of both theory and practice, their purpose being to ensure that our mine officials—managers, surveyors, overseers, and engineers—are competent to look after the lives and property entrusted to their care. In dealing with this question, it must be borne in mind that the personnel of our mine staffs has undergone a striking change in the past ten years, and it is now the rule, and not the exception, to find officials smart, intelligent men, who have had the advantage of a good education. In other words, our mines are now in charge of educated men, many of them with justifiable aspirations to reach the top of their profession and who study earnestly and persistently with this in view. Very many of these men are of a stamp that is bound to make its mark, and so far as we can see it is this class which will furnish the majority of our future mining officials. Provision for the education of these men up to the standard required by the Government Mining Engineer is therefore a matter of no small moment, and, naturally, such education must be of the nature of evening tuition. The School of Mines provides co-ordinated evening courses extending over four years, but it is doubtful whether these courses were really designed to meet the full requirements of these highly specialized examinations and, apart from any other consideration, the four years necessary, and the high aggregate fee, place them out of the question with mine officials; our mining community is a moving one, and the insecurity of tenure is such that the idea of a four years' course for the average adult worker is impossible. On the other hand, any attempt to meet the requirements of these men by compressing the tuition into a short period would, we suppose, probably result in more or less confusion and dislocation in connection with the normal courses of the school, and possibly it is because of this that the School is apparently not specially catering for such men, being perhaps satisfied to leave this specializing to Professor Yates, who for years past has made it his particular study, and who is at present so successfully carrying on this work independently of the School. This arrangement appears to be working admirably, Professor Yates' special lectures being supplementary to those of the School, and the only thing we can find the least fault with is that the conditions attending these special classes are necessarily such as to debar many good men from attending them—we refer to the scale of fees which has to be charged and which, being payable in a lump sum and in advance, place the classes beyond the reach of many who would like to attend. We believe we are correct in stating that because of the high standard of these Government examinations graduates of the different schools of mines—South African, British, American, German, etc.—find it advisable to take advantage of this special tuition, as the problems dealt with cannot possible be included in an ordinary school of mines curriculum. We are probably not erring much in saying that three out of every four men who would like to have the benefit of these special courses are, for financial reasons, compelled to forego the idea. This is regrettable, inasmuch that, quite apart from the certificate, the greater the knowledge acquired by our workers the higher the efficiency attained and the better for the industry and the country. In mentioning this subject of assisted education, we do not overlook the high rate of pay prevalent on the Rand. It is true the rate of pay is high, but it must be admitted that our cost of living is likewise high, and whilst in many cases the men can afford the fee there are many other instances where the margin between revenue and expenditure does not warrant it. Any scheme evolved would, of course, have to be administered with discretion. Looking at the matter in its wider aspect, we receive the impression that something should be done to help our officials and that in Johannesburg where money is being so generously provided, privately and by Government, to help our schools, the education of adults might advisedly be assisted and go hand in hand with that of the younger generation. The lavish provision of prizes, scholarships, and bursaries at the School of Mines, and Mr. Evans' address, suggest to us that we are in danger of overlooking the claims of the man who is already a worker of the country.

Sheba G.M. Co.

The following are the results of operations at the Sheba mine for the month of February, 1914:—Crushed, 6,240 tons, yielding 3,119 ozs. fine gold; estimated profits, £4,276.

RAND GOLD MINES IN 1913.

A Comparative Analysis of the Crushing Returns of the Principal Gold Producers.

I.—SUBSIDIARIES OF THE RAND MINES—CENTRAL INVESTMENT, BARNATO, ALBU & FARRAR GROUPS.

BELOW will be found an analysis of the crushing results of the leading Rand gold producers for the last two years. When it is borne in mind that the past year has been a unique one for the Transvaal in regard to one of the chief factors—namely, labour—the showing must be regarded as fairly satisfactory. Little difference is shown in the aggregate profits of the companies embraced by the analysis. For 1913 the profits arrgegated over £11,800,000, whereas in the preceding year the aggregate was only a little over £11,970,000. The Rand Mines-Central Investment group aggregate profits at £5,980,000, exhibit a slight decline—namely, about £80,000. The details are appended:—

RAND MINES—CENTRAL GROUP.

Aggregate results for years 1913 and 1912.

Company.		Ore milled. Tons.	Revenue. £	Expenses. £	Profit. £
Bantjes Consolidated,	1913	300,400	389,274	343,162	46,112
	1912	286,453	423,021	345,275	77,746
City and Suburban ..	1913	307,475	583,528	337,091	246,437
	1912	323,934	622,847	350,512	272,335
City Deep	1913	468,400	885,120	592,130	292,990
	1912	479,639	852,040	569,621	282,419
Crown Mines	1913	2,195,600	3,248,131	1,816,499	1,431,632
	1912	1,920,700	3,071,216	1,756,969	1,314,247
Durban Rood. Deep,	1913	291,590	420,512	358,266	62,246
	1912	293,995	439,699	357,614	82,085
Ferreira Deep	1913	645,070	1,304,738	624,296	680,442
	1912	531,640	1,109,156	571,714	540,422
Geldenhuis Deep ...	1913	623,300	907,604	762,070	145,534
	1912	627,960	946,155	811,302	134,853
Modderfontein B. ...	1913	404,580	784,427	334,337	450,090
	1912	388,570	725,220	343,067	382,153
New Heriot	1913	133,128	235,976	153,844	82,132
	1912	137,630	266,340	154,925	111,415
New Modder	1913	521,650	1,039,604	510,959	528,645
	1912	548,600	1,048,389	544,591	503,987
Nigel	1913	156,400	237,513	188,912	48,601
	1912	156,500	235,538	185,994	49,544
Nourse Mines	1913	585,286	886,702	642,203	244,499
	1912	641,000	953,938	678,920	275,016
Robinson Gold	1913	668,900	1,196,475	469,616	726,859
	1912	577,300	1,260,530	451,769	808,761
Rose Deep	1913	768,070	1,007,354	641,390	365,964
	1912	782,200	1,128,127	681,303	446,824
Village Deep	1913	536,300	798,687	556,665	242,022
	1912	596,900	889,246	594,436	294,810
Village Main Reef	1913	436,273	787,998	399,014	388,984
	1912	470,056	929,728	437,513	492,215

Average Results.

Company.	Revenue per ton.				Expenses per ton.				Profit per ton.			
	1913.		1912.		1913.		1912.		1913.		1912.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Bantjes Consolidated .	25	10	29	6	22	10	24	1	3	0	5	5
City and Suburban ...	37	11	38	5	21	11	21	7	16	0	16	10
City Deep	37	9	35	6	25	3	23	9	12	6	11	9
Crown Mines	29	7	32	0	16	6	18	4	13	1	13	8
Durban Rood. Deep ...	28	10	29	11	24	7	24	4	4	3	5	7
Ferreira Deep	40	5	41	10	19	4	21	6	21	1	20	4
Geldenhuis Deep	29	1	30	2	24	5	25	10	4	8	4	4
Modder B.	38	9	37	4	16	6	17	8	22	3	19	8
New Heriote	35	5	38	9	23	1	22	5	12	4	16	4
New Modder	39	10	38	2	19	7	19	10	20	3	18	4
Nigel	30	5	30	1	24	2	23	7	6	3	6	6
Nourse Mines	30	2	29	9	21	11	21	2	8	3	8	7
Robinson Gold	35	9	43	8	14	1	15	8	21	8	28	0
Rose Deep	26	3	28	10	16	9	17	5	9	6	11	5
Village Deep	29	10	29	10	20	9	19	11	9	1	9	11
Village Main Reef	36	1	39	7	18	3	18	8	17	10	20	11

The Barnato Group results show a considerable advance, the profits in the aggregate rising by over £160,000. The detailed particulars are as set out below:—

BARNATO GROUP.

Aggregate results for years 1913 and 1912.

Company.		Ore milled. Tons.	Revenue. £	Expenses. £	Profit. £
Con. Langlaagte	1913	523,100	711,363	459,131	252,232
	1912	295,072	412,481	288,542	123,939
Glencairn	1913	240,768	189,456	157,658	31,798
	1912	236,685	196,921	161,834	35,087
Ginsberg ...	1913	176,097	243,962	171,346	72,616
	1912	167,922	252,533	171,877	80,656
New Primrose	1913	295,800	415,883	195,690	220,193
	1912	289,000	422,966	206,816	216,150
New Rietfontein ...	1913	185,770	199,253	180,285	18,968
	1912	189,287	243,041	204,258	38,783
New Unified	1913	147,390	189,914	130,124	59,790
	1912	132,325	201,615	142,333	59,282
Witwatersrand Gold	1913	449,400	575,667	305,526	270,141
	1912	457,850	546,826	336,076	210,750

Average Results.

Company.	Revenue per ton.				Expenses per ton.				Profit per ton.			
	1913.		1912.		1913.		1912.		1913.		1912.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Con. Langlaagte	27	2	27	11	17	6	19	6	9	8	8	5
Glencairn	15	9	16	7	13	1	13	7	2	8	3	0
Ginsberg	27	8	30	0	19	5	20	6	8	3	9	6
New Primrose	28	1	29	3	13	3	14	4	14	10	14	11
New Rietfontein	21	5	25	7	19	6	21	7	2	0	4	0
New Unified	25	9	30	6	17	8	21	6	8	1	9	0
Witwatersrand Gold .	25	7	23	10	13	7	14	2	12	0	9	2

In addition to the above there is the Van Ryn Deep, which started crushing in mid-July, and to the end of the year treated about 182,000 tons for a working profit of £108,000, the grade rising towards the end of the year to 33s. 6d. and costs declining to nearly 19s. per ton.

As a whole the Albu mines more than maintained their positions, the aggregate profits for the year exceeding £750,000, in contrast with about £720,000. The statistics are appended:—

ALBU GROUP.

Aggregate results for years 1913 and 1912.

Company.		Ore milled. Tons.	Revenue. £	Expenses. £	Profit. £
Aurora West...	1913	170,661	227,352	168,564	58,788
	1912	162,597	202,622	160,239	42,383
Meyer and Charlton	1913	173,033	409,019	155,332	253,687
	1912	168,650	361,585	161,197	220,338
New Goch	1913	327,600	330,065	265,947	64,118
	1912	324,399	330,484	271,572	58,912
Roodepoort United ...	1913	303,852	286,676	273,133	13,543
	1912	362,439	365,246	326,460	39,786
Van Ryn	1913	438,760	609,919	340,474	269,445
	1912	468,790	648,982	360,783	286,210
West Rand Con. ...	1913	321,050	457,970	364,979	92,991
	1912	334,420	455,992	381,288	74,707

Average Results.

Company.	Revenue per ton.				Expenses per ton.				Profit per ton.			
	1913.		1912.		1913.		1912.		1913.		1912.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Aurora West	26	8	24	11	19	9	19	8	6	11	5	3
Meyer and Charlton ...	47	3	42	10	17	11	19	1	29	4	23	9
New Goch	20	1	20	4	16	2	16	9	3	11	3	7
Roodepoort United ...	18	10	20	2	17	11	18	0	0	11	2	2
Van Ryn	27	9	27	8	15	6	15	5	12	3	12	3
West Rand Con.	28	6	27	3	22	9	22	9	5	9	4	6

Of the mines of the Farrar Group the New Kleinfontein exhibits little net change, a welcome reduction in costs having more than offset a slight decline in grade and tonnage. The following are the detailed results:—

FARRAR GROUP.

Aggregate results for years 1913 and 1912.

Company.		Ore milled. Tons.	Revenue. £	Expenses. £	Profit. £
East Rand Props. ...	1913	1,739,000	2,772,754	1,789,740	983,014
	1912	1,848,050	3,022,108	1,945,362	1,076,746
New Kleinfontein ..	1913	530,600	733,997	493,548	240,451
	1912	549,730	775,708	535,054	240,654

Average Results.

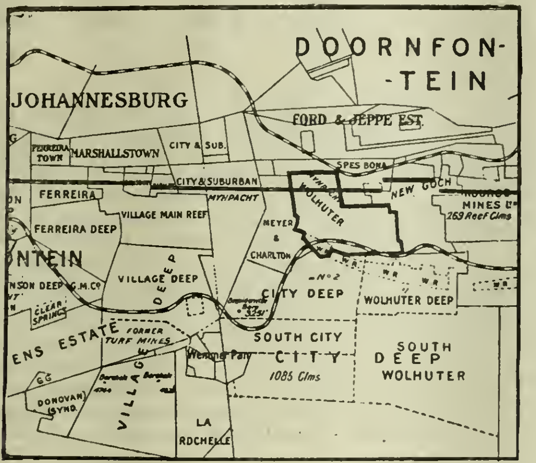
Company.	Revenue per ton.				Expenses per ton.				Profit per ton.			
	1913.		1912.		1913.		1912.		1913.		1912.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
East Rand Prop.	31	10	32	9	20	7	21	1	11	3	11	8
New Kleinfontein .	27	8	28	2	18	7	19	5	9	1	8	9

The East Rand Proprietary was also able to reduce its costs, but a decreased average revenue and reduced tonnage affected profits to the extent of £94,000. Here, again, the strike has been marked.

DEVELOPMENTS AT THE WOLHUTER.

A Strike of Great Prospective Importance—Satisfactory Labour Position.

Development which may be attended with results of the greatest importance to the company has recently been carried out in the Wolhuter mine. On the twenty-second level, in the eastern section of the mine, the Main Reef Leader has just been encountered, and the values are remarkably good. The management of the controlling house, Messrs. S. Neumann & Co., is not in favour of publishing particulars as to reef widths and values, since (as has been already stated) intersection of the reef in this section of the property has only just been effected and not a foot of actual driving has been carried out. In the Wolhuter, as in every other mine, assay values and widths vary greatly over comparatively small sections, and the Wolhuter people are disinclined, and rightly so, to give any figures as to the width and value of the reef where encountered, until more work on this strike has been accomplished. A drive is being commenced at once, and if after 100 feet or so have been driven values are maintained the company will be then entitled to attach very considerable importance to developments in this section of the property, but the directors do not at the moment favour announcing particulars which might lead the public to attach inflated value to this latest strike and then have these hopes disappointed by the meeting of a poor zone.



Large Unexplored Areas.

This attitude is quite commendable, but whilst it is inadvisable to attach too much importance to this intersection at the present, it can be stated that the development referred to is of great prospective importance to the Wolhuter. Indeed, if good values and widths continue, the outlook for the mine will be changed substantially for the better. The important points to bear in mind are (1) that this eastern section of the Wolhuter property has been but little exploited in the past, and (2) that between the twenty-second level of the Wolhuter and the southern boundary, where the City Deep mine begins, there is a large stretch of ground to be developed. Hitherto the eastern section of the Wolhuter has yielded a comparatively small proportion of the ore sent to the mill. The western portion has been the largest contributor, and in the past the development disclosures in the eastern area seemed to indicate that the ground is much more broken there than in the western portion. From the point where the Main Reef Leader has just been cut in the eastern section of the Wolhuter to the western boundary of the New Goch is a very considerable distance, and it is accordingly unnecessary to dwell at length on the importance to the Wolhuter Company of opening up a large section of settled and payable ground in this portion of the mine. As to the second point, it may be remarked that the Main Reef Leader has opened up very well in the City Deep mine, immediately adjoining the Wolhuter on the south, and in view of this there are reasons for hoping that a stretch of payable ground in the Wolhuter will be opened up in depth as well as laterally.

The South Reef.

Another point in connection with the latest developments in the Wolhuter mine is that recently some very good values have been disclosed on South Reef. The point is of comparatively minor importance, as values on this reef vary from time to time, but it certainly seems worthy of remark.

Recent Results and the Labour Aspect.

It will here be of interest to refer to developments in the Wolhuter mine as disclosed in the last annual report of the company—that is, for the twelve months ending October 31st last. In this Mr. D. Wilkinson, the consulting engineer, stated:—The cost of mining has increased by about one shilling per ton, due chiefly to the more broken nature of the ground in the eastern section, which necessitated additional subsidiary development and also reduced the tonnage efficiency per employee in this section. The number of feet "crosscuted," driven, raised and sunk, was 10,849 feet, an increase of 310 feet, the result being an exposure of 330,763 tons having an estimated assay value of 6·1 dwts. over 54·5 inches. The assay value is practically the same as for the payable ore exposed during 1912, but the tonnage is 14,000 less. The Main Reef Leader, west of the deep level shaft, has shown consistently good values on all the lower levels, but the South Reef has been disappointing, and this is the main cause of a decrease in the total payable ore reserves of 48,877 tons. During the past year an additional 38 drill compressor was installed, which since July last has assisted materially in keeping the battery supplied although native labour has been scarce. The auxiliary shaft from the 20th level in the deep level section was sunk 240 feet during the past year, and will be pushed ahead during this year for the purpose of developing the large area in the eastern portion of your property as quickly as possible. In regard to the reference to native labour, it is satisfactory to learn that the company is now very well off in this respect. In fact, the mine has at present practically a full complement of boys. Accompanying this article is a map, which shows the position of the Wolhuter Company's claims in relation to surrounding properties.

Luipaardsvlei Estate.

The following is the result of operations for last month: 60 stamps ran 27·176 days, crushed 16,270 tons, yielding 1,800 ozs. fine gold; three tube mills ran 27·722 days, yielding 712 ozs. fine gold; sands treated, 11,500 tons, yielding 1,271 ozs. fine gold; slimes treated, 4,770 tons, yielding 497 ozs. fine gold; profit from operations, £3,061; sundry revenue, £900; total profit, £3,961; working costs per ton crushed, 18s. 3·936d.

Star of Rhodesia.

The secretary writes:—I beg to advise you that the following are the last assays from development of this subsidiary of the Romola Nigel Gold Mining Company:—No. 3 west drive: distance 20 ft., width 33 ins., assay value 4·5 dwts. No. 4 winze: depth 60 ft., width 18 ins., assay value 27·5 dwts. No. 5 winze west drive: depth 45 ft., width 33 ins., assay value 31·0 dwts. No. 5 winze in east drive: depth 15 ft., width 18 ins., assay value 20·5 dwts. Tailings assays were: 8·5 dwts. and 7·2 dwts.

Rhodesian Section.

LATEST MINING NEWS.

The Bell Reef Plant—Wankie Colliery—Native Labour on the Mines—Congo Mining Progress —Native Mortality on the Mines—Gaika Ore Reserves—Railway Rate Reductions.

THE erection of the treatment plant at the Bell mine has at last been completed, and, according to a cablegram recently sent to the London office of the company by the local staff, the trial run of the machinery commenced last month. It is understood that this preliminary " run " is giving satisfaction, but it is not stated when the first official output will be announced.

* * * *

With reference to the " Note " in mail week's *Financial News*, announcing that the Union Minière was endeavouring to acquire a large holding in Wankie Colliery, we understand (says that paper in a later issue) that the Congo undertaking has made the placing of a large contract conditional on obtaining 100,000 shares. To facilitate the business, the Wankie Company will create 40,000 new shares, and the Mashonaland Agency is willing to provide from its holding the balance of 60,000 shares.

* * * *

According to the report of the Executive of the Rhodesia Chamber of Mines for January, the following is the summary is the returns of native labourers employed on Southern Rhodesia mines during the months of November and December, 1913:—

	November.	December.
Local	10,066	9,690
Portuguese Territory ...	6,246	6,490
N.W. Rhodesia	3,406	3,724
N.E. Rhodesia	5,716	5,527
Nyasaland	6,671	6,847
Other sources	926	920
	33,031	33,198

* * * *

Congo mining is progressing. Up to November 5, 1913, the total output of copper for 1913 was 5,831 tonnes of ingots and 129 tonnes of matte. The plant required for working the tin mines of Bukama was sent from Antwerp in June last, and the exploitation of the tin alluvials of this region is to be undertaken as quickly as possible. The gold mines of Kilo will show a considerably increased output for 1913. They are situated in the north-east of the Belgian Congo, and employ about 2,600 natives, whose rate of pay is 6 francs per month with food and lodging. The output for the last five years is as follows:—1909, 656 kilos; 1910, 876 kilos; 1911, 639 kilos; 1912, 981 kilos; 1913, 1,360 kilos (estimate). The gold worked is alluvial, and the reserves are estimated at about 12,500 kilos. Efforts are now being made to discover the quartz reefs considered to be the origin of the gold.

* * * *

A further material expansion took place in the second half of last year in the ore reserves at the Gaika. About 3,000 tons per month is the present rate of crushing, and the ore in sight is equal on this basis to two and a-half years' supply for the mill. Appended is a contrast of the past four half-yearly estimates:—June 30, 1912: 57,755 tons, valued at 15·1 dwts. December 31, 1912: 67,583 tons, valued at 14·04 dwts. June 30, 1913: 71,893 tons, valued at 14·1 dwts. December 31, 1913: 96,000 tons, valued at 14·5 dwts.

* * * *

The mortality amongst natives on Rhodesian mines for the year ending 31st December, 1913, shows a decrease of 297, or 7·42 per 1,000 per annum, when compared with 1912. 409 of the deaths were attributed to pneumonia, giving a mortality of 12·37 per 1,000 per annum from this cause, as compared with one of 17·01 in 1911, and 19·37 in 1912. The mortality is computed on the daily average employed. Comparative figures for the past four years are appended:—

Diseases.	1910.	1911.	1912.	1913.
Total deaths	1,682	1,085	1,073	783
Mortality per 1,000 per annum ...	44·46	28·62	31·10	23·69
Accidents.				
Total deaths	182	164	163	156
Mortality per 1,000 per annum ...	4·81	4·33	4·73	4·72
Total deaths	1,864	1,249	1,236	939
Mortality per 1,000 per annum ...	49·27	32·95	35·83	28·41

* * * *

Speaking in Bulawayo the other day Mr. Wilson Fox announced some highly important reductions in railway rates. The reduction in cement is 49s. 2d. per ton, giving a reduced cost at, for instance, Bulawayo, of 9s. 10d. per cask. Coal is reduced at pit's mouth from 10s. to 9s., and the railway rate is reduced by amounts varying from 1s. per ton at Bulawayo to 1s. 7d. at Salisbury. In addition the coal rates on the Shamva, Eldorado, and Umvuma branches are reduced to a maximum of ¾d. per ton per mile, while the reduction in the mining machinery rate is 31s. 2d. per ton from Beira to Salisbury, leading to considerable adjustments in the rates to other stations on the line. Dynamite is reduced from 1st to 2nd class rates in lots of less than one ton consigned from distributing centres in Rhodesia, while the rate from Beira to Salisbury per ten-ton lots is reduced by 1s. 7d. per 100 lbs. Pebbles for tube mills are reduced by 50 per cent., and a revision of the high charges on bullion is promised.

Heroine Closes Down.

The Heroine Gold Mine, Umsweswe, has closed down.

Lonely Reef G.M. Co.

The following are the results of operations at the Lonely Mine, Rhodesia, for the month of February, 1914:—Mill ran 23·95 days; crushed 5,910 tons; yield of fine gold, 1,541·561 ozs., value £6,474 18s. 2d.; slimes treated, 5,910 tons; yield of fine gold, 2,940·66 ozs., value £12,363 16s. 5d.; total recovery of fine gold, 4,482·221 ozs.; total value, £18,814 14s. 7d.; estimated profit, £10,444.

Rezende Mines.

The results for the month of February, 1914, are as follows:—Estimated profit: Central Section, £1,501; Old West Workings and Penhalonga Sections, £1,000; total estimated profit, £2,501.

It is reported that the new strike on the Giant South Mine, in the Gadzema district of Mashonaland, is developing most satisfactorily and that already the lengthening of the life of the Giant to a very considerable degree is assured. If this rumour be true, it will be a very important thing indeed, for the Gadzema district in general, and the Giant Company in particular, as developments in the Giant Mine have been most disappointing for some very considerable time past.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Lot of the Rand Mining Student.

A REPLY TO Mr. SAMUEL EVANS.

To the Editor, *South African Mining Journal.*

Sir,—It may possibly be of interest to Mr. Samuel Evans and others who hold like opinions to those quoted in his speech at the presentation of prizes at the S.A. School of Mines to hear the opinions of an old mining student who has worked on these fields during the last seven years. Mr. Evans lays stress on the facilities offered for training. He surely must be aware that the system of mining on the Rand is day by day getting more mechanical, that the authority of the officials is getting less, and departure from hackneyed methods is looked on as a species of lunacy. The real mine manager of to-day does not reside on the mine. There is no incentive to originality, no reward for perseverance or skill. The writer remembers endeavouring to obtain three months' employment in a reduction works to improve his practical knowledge at no remuneration whatever, but was informed that youths straight from school were preferred and that being over 22 years of age was an insuperable barrier. This from a consulting metallurgist in Mr. Evans' own group, hardly squares with his remarks as to a student's advantages. A student fortunate enough to rise to be a mine manager whose whole practical training deals with rock breaking, is likely to be a rather unintelligent head of affairs when he has to be entirely dependent on his reduction officer. In conclusion, if it really is the technically trained man that is required, as Mr. Evans says, it would be instructive to look at the history of some of the mine captains and even underground managers employed on the Reef to-day, when scores of men better qualified, with longer service to their credit are rusting for want of use. There must be a surplus, since promotion is so slow and erratic, in many cases, a man from oversea with no Rand experience whatever has been even sent for to fill some good position. Meanwhile, how are we treated? We work conscientiously, year in year out, for a lower wage than an average miner. We are not treated as professional men in any sense of the term. How many miners would accept a shift boss's job if it were offered them, and if they even accepted it, how long would they be content to keep it? On many mines they are training young men as samplers and surveyors. Is this competition fair? There is no profession which offers so few advantages, so much hardship, and so little remuneration as that of a mining student on the Rand. Not one of my own year's college friends would take up mining if they had their chance to pick a profession offered them again. With regard to phthisis, many of my friends are affected; certainly none of them are in the same state of health that they were on commencing, and few, very few, have reached those positions which are the reward for the extravagant premium of health and expensive education demanded. Apologising for the trespass on your space.—Yours, etc.,

"E. PLURIBUS UNUM."

[Our disgruntled correspondent, like the lady in Shakespeare, "protests too much"! In every walk of life will be found people who believe the profession or calling they have chosen to be the most ill-favoured of all. This is mainly because they have no experience of the others.—Ed., *S.A.M.J.*]

National Diamonds.

To the Editor, *South African Mining Journal.*

Sir,—As a shareholder in the above, I was greatly interested to read the article, "The Facts about National Diamonds," in your issue of February 28th; and many shareholders like myself were greatly surprised at the apparent large amount of shares, which have been issued from time to time without proper explanation being given. One must admit that you placed the past history of this company before your readers in a very clear manner, the surprising thing is that shareholders have not taken concerted action and demanded from directors an explanation of their past and, may I say, present actions. As one who has followed the affairs of this company for several years, I am quite certain that many occurrences in the past require examination. May I, therefore, put the following questions:—

Query 1: When the company was re-organised the application to Court stated:—(a) "In return for reconstruction and financing the syndicate, and procuring a new option contract for 2½ years, £10,500." It is thus clearly stated that re-organiser had to do three things: Reconstruct, finance and procure new option contract. The re-organiser fulfilled his contract, as he received payment of his £10,500 in shares (see balance sheet to March 31st, 1913). Now, sir, shareholders were informed at last annual general meeting by the directorate that he provided the sum of £3,500 to finance the company. A perusal of the balance sheet shows that the total income of the company for that year was only £860 (for diamonds). Where is the £3,500? Is it lost, mislaid, or forgotten? (b) A further study of this balance sheet reveals this striking item: "To head office expenses, including salaries, legal expenses, stationery and advertising, rent, interest, etc., £2,072 18s. 4d." Seeing that a large portion of the year under review was occupied with the re-organisation scheme, the expenses of which were naturally paid the re-organiser, as he was to, and did, receive £10,500 in shares for this work; and also that for the major portion of that year the secretary was the only paid head office official, it would possibly reveal a most interesting state of affairs if the present directorate would have prepared for inspection a detailed statement of how this very large amount was expended. (c) Did the owners of farm Rietfontein receive a certain number of shares as an inducement to give the new 2½ years' option contract? If so, were these provided by re-organiser or the company; and if by the latter, why? Also were ex-directors, officials, etc., presented with shares as payment for services rendered? If so, how many?

Query 2: (a) When the capital of the company was £30,000, provision was made for £8,500 reserve, £6,000 of which was voted by shareholders for a specific purpose, but no account has been given of how the balance of £2,500 was used. Will directors please explain? (b) At a special meeting of shareholders, directors asked for and obtained power to purchase for £7,000 certain ten morgen of Kaalfontein (including Schullers No. 2), to be paid for by £6,000 in shares and £1,000 in cash. The balance sheet shows that the first item has been paid out, but nothing is shown of any payment of the £1,000 cash, neither does it show that the amount is regarded as a liability, but an examination of the assets show this:—"Option to purchase mineral rights of certain ten morgen (including Schullers No. 2), part of farm Kaalfontein 102, district Pretoria. Note.—This option has since been exercised." This, to say the least, seems very peculiar: purchase price is £7,000, £6,000 is paid, £1,000 still owing, and yet as an asset it is only an "option to purchase." What was the actual price paid for this land? If the balance sheet is correct, one must presume that it was only £1,000. If so, who received the £6,000 in shares?

Will directors please explain? Now, sir, these are only a few questions that shareholders are asking and expect to be answered. The following table will enable readers to understand the exact position as regards the various alterations of capital from time to time, and shows the amount of shares which require some explanation:—

Capital of £30,000—	
A. Allotted to shareholders	£7,500
Re-organiser	10,500
Working capital	3,500
	21,500
Unexplained	8,500
	£30,000
Increased Capital of £40,000—	
B. Working capital	10,000
Reserve	4,000
Unexplained	26,000
	£40,000
Increase Capital of £70,000—	
C. Working capital	£25,000
Reserve (?)	7,000
Unexplained	60,500
	£70,000
Unexplained—A.	£8,500
Unexplained—B.	26,000
Unexplained—C.	60,500
Also difference in working capital as explained in previous article ...	500
Also cash provided by re-organiser...	3,500
	£99,000

£99,000 unexplained out of total capital of £140,000. Now, sir, shareholders would like to know what our directors are going to do in this matter. Surely after such publicity they will try and meet the reasonable wishes of those whom they represent. It is interesting to note that the capital is now £170,000—an increase of £30,000. I wonder——— but there, I must not trespass upon your valuable space any more this time, although there are many other and, if possible, more important facts which need explanation, of which more anon. Thanking you in anticipation.—Yours, etc.,

J. LIGHT.

5, Jeppe Arcade, Johannesburg,
March 9th, 1914.

ANSWERS TO CORRESPONDENTS.

"B. B."—Nothing wrong with the mine—market rumours only.

"Oil."—Mr. Cunningham Craig's report, obtainable from the "C.N.A.," is the last word on the subject.

"Reserve."—Too personal; no purpose would be served by publication.

"Contra."—The longer lived mine is certainly the better purchase. It started all wrong, but will "make good." The adjoining outcrop may be finished in five years.

"Z."—There is nothing wrong with the mine, but the market for the product is unfavourable.

"Safety."—The address of the secretary is Cullinan Buildings, Main Street, Johannesburg.

"G. H."—The practice is followed every day by Rand companies, and is certainly not illegal.

A YEAR'S SOUTH AFRICAN INSOLVENCIES AND COMPANY LIQUIDATIONS.

Points from Reports from the Four Provinces—Valuable Patents, Trade Marks, and Company Statistics.

In his annual report for 1912 the Cape Master of the Supreme Court reports that the improvement mentioned in his last report had not been maintained. The number of voluntary surrenders had increased by 41, and compulsory sequestrations by 25, or an increase of 18 per cent. and 28 per cent. respectively; while the number of rehabilitations had decreased by 11 or the equivalent of about 5 per cent. In his opinion the severe drought through which the country passed had contributed somewhat to this unsatisfactory state of things. There had actually been 270 voluntary surrenders, 111 compulsory sequestrations, or a total of insolvencies of 381 and against this only 201 rehabilitations. The assets declared in the 270 estates voluntarily surrendered amounted to £218,793, and the liabilities to £351,291, while in the 111 estates compulsorily surrendered the assets amounted to £110,934 and the liabilities to £192,569. Voluntary surrenders have come down from 601 in 1904 to less than half that number; compulsory sequestrations fell from 234 in 1905 to 84 in 1910, but had been going up again somewhat to 86 in 1911 and to 111 in 1912. In Griqualand West there were six voluntary surrenders, three compulsory sequestrations and two rehabilitations. In the Transvaal the Master commented on the upward tendency both with regard to voluntary surrenders and compulsory sequestrations. The number of rehabilitations exhibited a regrettable falling off, due in great measure to the fact that many applications for rehabilitation had ben refused or their granting suspended on account of the misconduct of the applicants. The increase in the number of discharges and superseding orders tended to indicate that the aid of the Court was frequently invoked, in the first instance with the object of enabling the insolvent to escape from his creditors. Estates were sequestrated—only too often there was reason to think with the collusive assistance of a creditor—and when it was found there were no assets in the estate, and claims were not proved, application had to be made to the Court (sometimes at the public expense) for the discharge of the estate from sequestration. The Insolvency Law was in many respects urgently in need of amendment. There had actually been 96 estates voluntarily surrendered and 254 compulsorily sequestrated as insolvent; or a total of 350 insolvencies, and against this only 86 rehabilitations and 80 discharges or superseding orders, or a total of 166. From the highwater mark of a total of 414 insolvencies in 1907 the number declined to 191 in 1910, but has since steadily risen. The Transvaal Master also deals with the liquidation of companies. During 1912 there were 21 foreign companies in liquidation and under the new Companies' Act of 1909, 17 companies in liquidation under order of court, 78 voluntary liquidations, and there were four discharges; 84 companies which went into liquidation during the year represented a capital of £2,493,905. In Natal the Master had 81 insolvencies with assets amounting to £30,860, and liabilities to £58,301. There had been 13 rehabilitations which was regarded as the average number. The number of insolvencies remained the same as in the previous year, but there was a considerable drop both in the amount of the liabilities and of the assets. The deficiency as compared with the previous year dropped to the extent of £14,227. In the Free State the Master considered that the unfavourable increase of insolvency had fallen heavily upon the farming community (45 per cent.) and upon those largely dependent on farming—the general dealers (22 per cent.). He attributed the cause to the adverse agricultural and pastoral conditions of the past two years. One favourable feature was the relatively high proportion of assets to liabilities, pointing to genuine stress of circumstances rather than to any reasons of undue speculation. The total number of estates sequestrated during the year was 64, with £20,988 assets and £45,202 liabilities. The Free State and Natal are the only two of the Provinces in which assignments of estates are regulated by law in addition to insolvencies. In Natal there had been nine Deeds of Assignments registered and 46 Deeds of Composition, an arrangement which comprised 16 of full payment, two of 10s. in the £1, one of 7s. 6d., one of 5s., one of 4s. 8d., two of 4s., one of 3s. 6d., six of 2s. 6d., six of 1s., one of 1s. 9d., one of 1s. 6d., five of 1s., two of 6d., and one of 3d. in the £1. The total assets were £35,291, and the total liabilities £68,526. As compared with the previous year these showed a greater deficiency to the extent of £1,558, although there were five fewer deeds registered. The debtors included 13 shopkeepers, five clerks and one solicitor. In the Free State 15 estates were assigned as compared with ten in 1911. The assets represented £4,879 and the liabilities £8,337.

The Patent Office and its Work.

The returns show a slight decrease in the number of applications lodged in the Transvaal and Orange Free State and an increase in the number of applications filed in the Cape of Good Hope and Natal. It is interesting to note that the number (671) of inventions sought to be protected in the Transvaal in 1912 exceeded the total number (589) sought to be protected in the three other Provinces. In the Transvaal by far the greater number of applications are derived from South Africa. Of these 363 come from inventors residing in the Transvaal and 19 from the Cape. Great Britain sent 123, Australia is responsible for 20. Of the foreign applications 58 come from the United States of America and 38 from Germany. It may be interesting to know that the fair sex contributed four applications; these relate to (1) respirators, (2) elastic tyres, (3) glass-making and (4) ladies' headgear. In Natal and the Orange Free State the applications from South Africa, though fewer in number than those derived from Great Britain, exceed the number derived from foreign countries. The Cape return does not give any figures, but it would appear that the applications come chiefly from the British Isles and South Africa; but foreign countries and British Colonies are also annually responsible for a certain number of applications. In the Transvaal the largest number of inventions lie in classes 82 (metals and alloys); nine (ammunition, explosives, etc.); 59 (grinding, crushing, etc.); 124 (stone, etc.); but during the period under review there has been a falling off in class 46 (filtering, etc.), and class 82 (metals and alloys), and an increase in class nine (ammunition, explosives, etc.), and class 32 (distilling, etc.). In Natal 61 inventions relate to machinery (general) 42 to manufacture (general) and 24 to farming implements and tools, but there is a decrease in inventions relating to railways, vehicles and electricity. In the Cape of Good Hope the inventions relate chiefly to electrical and mechanical appliances, machinery and re-inforced concrete appliances. In the Orange Free State the inventions relate chiefly to machinery and processes for manufacture. Of the 34 oppositions lodged in the Transvaal one was granted by the Court, 10 were abandoned, eight resulted in an amendment of the specification before the Commission of Patents and 15 are pending. In the Cape 291 applications were received as compared with 236 in the previous year. and 227 were granted. In Natal 189 applications were received as compared with 175 in the previous year and 156 were granted. In the Free State 109 applications were received, as compared with 118 in the previous year, and 71 were granted.

Trade Marks.

It is pleasing to note a substantial increase in the applications lodged in each Province. The Cape received 325, as compared with 231 in 1911; Natal 221 as compared with 139, and the Free State 128 as compared with 77. In the Transvaal, 311 applications were filed in 1911 and 539 in 1912. The number lodged during the past year exceeds the number filed in any previous year. During the period between the introduction of the first Trade Marks Act in 1887 and 1st January, 1899, only 526 applications were lodged with the Registrar. The progress shown is a fair indication of the growing interest in and value of trade marks which form an intricate but interesting part of our law. In the Transvaal the applications derived from South Africa (261) exceed the number derived from any other source. In Natal the applications from South Africa (54) are fewer in number than those received from Great Britain (117), but exceed the total number sent in by persons residing in foreign countries. On the other hand in the Orange Free State the number of applications from South Africa (18) are fewer in number than those derived from other sources (110). The Cape Report shows that applications are chiefly derived from Great Britain and South Africa. Of the applications lodged in the Transvaal, 178 come from local traders, 43 from the Cape, 23 from Natal and 172 from Great Britain. Of the foreign applications 21 come from Germany, eight from Spain and 50 from the United States of America. In Natal 114 come from Great Britain, 27 from the United States of America, 27 from local traders and 17 from the Cape. In the Orange Free State 75 come from Great Britain, three from France, four from Germany and 12 from the United States of America. In the Transvaal 32 marks were assigned and four opposed. Of the oppositions one is pending, one has been withdrawn and two resulted in the withdrawal of the applications for registration. The most popular classes in which registration is sought in the Transvaal are classes 3 (medicines), 13 (metal goods), 42 (substances used as food), 45 (tobacco) and 47 (candles, soap, etc.); in Natal, classes 13, 38 (articles of clothing) 42, 45 and 47; in the Orange Free State, classes 38, 42, 45 and 47, and in the Cape, classes 3, 42, 43 (liquors and spirits), 45.

Registration of Companies.

The number of companies (234) registered in the Transvaal in 1912, as might be expected in view of the great mining industry, far exceeds the total number (143) shown in the returns from the Cape, Natal and the Free State. The same remark applies to increases of capital. No provision is made in the Cape Law for the registration of foreign companies. The number of foreign companies is included in the general figures for the other Provinces. With regard to companies not for profit, if provision were made for the registration of companies limited by guarantee, the returns, at all events those for the Transvaal, would, in the Registrar's opinion, show a larger number of registrations. It may not be desirable to allow trading associations to be registered as companies limited by guarantee, but there appears to be no reason why this principle should not be applied to non-trading associations contemplated by section 21 of the Act (No. 31 of 1909, Transvaal), more especially as such associations rarely if ever have a share capital. The nominal capital of companies registered in the Transvaal in 1912 is £2,159,638. The foreign companies registered in the Transvaal for the same period represent a nominal capital of £10,064,250. The nominal capital of the companies registered in the Cape during the period under review is £1,367,914. In the Transvaal, ten reductions of capital were registered and the capital involved was £934,336. Also 75 companies were dissolved, in terms of Section 196 of the Act (Transvaal).

N.W. Prospecting Syndicate, Ltd.

The N.W. Prospecting Syndicate, a Kimberley oil venture, now boring in the Carnarvon district, is endeavouring to raise further funds to continue drilling. Mr. Cunningham Craig's report has apparently damped shareholders' ardour.

Get Your Certificate.

Private Individual Tuition for Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine Drivers' Examinations. Practical Mathematics and Electrotechnics. Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings, Box 2061.

GRADE, COSTS, AND PROFITS IN JANUARY.

Chamber of Mines' Analysis.

THE following tabulation of the operations of the mines of the Transvaal contributing to the gold production is supplementary to the details published by the Chamber of Mines in its declaration on the 10th of the month:

THE WITWATERSRAND.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West Untd.	15,041	22	8	20	4	13,444	1,627	2	5
2. Bantjes Consolidated	27,164	24	0	22	4	25,031	1,768	1	7
3. Brakpan Mines ...	65,373	27	11	19	1	44,039	20,939	9	1
4. City Deep	71,239	39	0	25	11	44,680	22,789	12	8
5. City and Suburban	45,285	37	1	19	11	24,281	20,481	16	9
6. Con. Langlaagte ...	51,754	26	10	16	6	31,387	19,682	10	6
7. Con. Main Reef ...	26,514	31	6	23	4	19,494	6,599	7	11
8. Crown Mines	249,852	29	11	15	5	128,824	118,433	14	2
9. Durban Roodepoort	15,101	21	10	15	11	11,022	4,079	5	11
10. Durban Rood. Deep	31,340	28	8	25	4	27,744	3,209	2	11
11. East Rand Prop. ..	190,511	31	0	22	4	137,923	47,074	7	8
12. Ferreira Deep	113,325	45	6	18	8	46,322	65,992	26	7
13. Geduld Proprietary	28,991	34	1	26	7	22,617	6,303	7	5
14. Geldenhuis Deep ...	64,540	29	3	24	11	54,445	8,786	4	0
15. Ginsberg	17,959	23	10	18	10	13,868	3,903	5	4
16. Glencairn M. Reef	14,863	14	0	12	5	12,375	1,562	1	7
17. Knight Central ...	27,432	22	6	18	5	22,328	4,739	3	11
18. Knights Deep	60,704	13	11	11	6	49,550	13,263	3	1
19. Langlaagte Estate .	56,631	20	4	18	1	42,582	13,103	5	7
20. Luipaardsvlei Est. .	16,337	21	7	20	9	15,738	417	0	7
21. Main Reef West ..	25,894	29	9	22	8	19,581	5,911	6	10
22. May Consolidated ..	8,763	16	8	16	3	8,514	229	0	5
23. Meyer and Charlton	44,474	49	2	18	9	14,074	30,426	40	7
24. Modderfontein B ..	58,232	38	7	16	5	24,839	32,781	21	9
25. New Goch	31,816	22	9	17	0	23,810	8,007	5	9
26. New Heriot	21,298	45	7	25	6	11,707	9,322	20	3
27. New Kleinfontein .	54,736	27	0	20	4	40,526	13,573	6	10
28. New Modderfontein	77,470	39	9	16	3	31,747	44,983	23	4
29. New Primrose	28,315	22	4	13	0	15,560	11,921	9	11
30. New Rietfontein ...	13,631	19	11	20	5	13,962	*331	*0	6
31. New Unified	14,956	23	0	15	5	9,872	4,853	7	7
32. Nourse Mines	60,798	29	8	21	11	44,890	15,254	7	5
33. Princess Estate ...	27,891	25	9	24	2	26,236	1,587	1	6
34. Randfontein Cent.	201,007	24	0	18	7	154,218	44,527	5	4
35. Robinson	99,210	36	11	14	4	38,393	59,232	22	2
36. Robinson Deep ..	62,985	27	0	16	6	38,353	25,569	11	0
37. Roodepoort United	22,203	19	1	19	4	22,346	12	—	
38. Rose Deep	68,656	22	0	17	6	54,484	13,436	4	3
39. Simmer & Jack ..	73,800	21	0	11	8	38,848	30,577	9	2
40. Simmer Deep . ..	40,698	14	2	13	3	38,039	2,123	0	9
41. †Spes Bona Tribute	4,596	17	0	—		—	—	—	
42. Van Ryn Estate ...	39,912	26	0	18	11	28,943	11,247	7	4
43. Van Ryn Deep ...	50,455	33	3	20	3	30,738	19,719	13	0
44. Village Deep	63,707	30	4	22	3	46,639	16,343	7	9
45. Village Main Reef	65,993	40	8	18	6	29,656	34,763	21	8
46. Vogelstruis Estate	12,981	20	8	18	10	11,354	1,663	2	9
47. West Rand Central	3,305	36	5	31	6	2,856	447	4	11
48. West Rand Cons.	20,661	24	9	26	10	22,221	*1,426	*1	9
49. Witwatersrand	46,789	23	7	14	2	28,065	18,725	9	5
50. Wit. Deep	61,167	27	5	15	7	34,693	25,736	11	7
51. Wolhuter	37,142	26	3	18	5	26,095	10,617	7	6
Miscellaneous producers	8,173	—		—		—	—	—	
Witwatersrand totals	2,641,670	27	4	18	2	1,720,953	876,577	9	3
				50 cos.		50 cos.	50 cos.	50cos.	

*Loss. †Private.

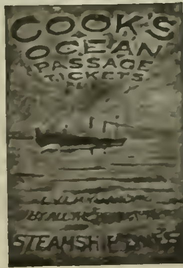
The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
HEIDELBERG—									
1. Nigel	19,935	29	5	25	0	16,667	3,045	4	7
2. Sub-Nigel	10,959	42	5	30	5	7,869	2,100	8	1
BARBERTON—									
3. Barrett	1,079	8	11	—		—	—	—	
4. Sheba	13,066	44	6	30	0	8,803	4,193	14	3
5. Worcester	3,589	17	1	15	3	3,200	372	1	9
KLERKSDORP—									
6. Quest	2,931	14	8	11	7	2,323	609	3	1
LYDENBURG—									
7. Ceylon's Lydenburg	922	28	10	26	4	842	63	1	11
8. Glynn's Lydenburg	8,852	45	8	18	11	3,681	5,010	25	10
9. Trans. G.M. Ests.	39,819	54	9	23	0	16,749	22,625	31	1
Miscellaneous producers	25,648	—		—		—	—	—	
Total (outside districts)	126,800	37	4	23	4	60,134	38,017	14	9
				8 cos.		8 cos.	8 cos.	8 cos.	
Grand totals	2,768,470	27	7	18	3	1,781,087	914,594	9	5
				58 cos.		58 cos.	58 cos.	58 cos.	

Zaaiplaats Tin.

Results for the month of February, 1914:—Days run, 22·4 days; ore milled, 2,759 short tons; residues re-treated, 1,641 short tons; concentrates won, 95 long tons; average value of concentrates, 67 per cent. metallic tin; estimated profit for the month, excluding Government tax on profits, £4,459 14s. 1d.; less adjustments in respect of estimated values of previous shipments, £92 15s. 5d.; profit declared for the month, £4,366 18s. 8d.; capital expenditure, £85. Mining operations during the month were again restricted, owing to the shortage of labour. The increase in the supply was disappointing, but since the end of February the position has improved.



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THE FEBRUARY OUTPUT IN DETAIL.

Some Important Aspects Considered—Daily Yields and Labour Statistics.

The following are the salient figures of the gold output for the month of February:—

Total output	626,261 ozs.
Value	£2,660,186
Decrease	25,492 ozs.
Value	£108,284
Witwatersrand	597,545 ozs.
Value	£2,538,211
Decrease	24,357 ozs.
Value	£103,459
Outside Districts	24,716 ozs.
Value	£121,975
Decrease	1,135 ozs.
Value	£4,825
Total Stamps	9,648
Increase	68
Witwatersrand	9,100
Increase	65
Outside Districts	548
Increase	3

Although the gold output of the Transvaal for the month is not only substantially less than the January return, and whilst it is less than the output of July last, when work right along the Reef was seriously hampered by the disturbances of that month, and is also the smallest return that has been recorded for several months' past, there are nevertheless one or two hopeful and satisfactory features in connection with the latest output which are worthy of remark.

Daily Averages.

In the first place it should be borne in mind that February was a short month, and on the basis of running time the February output is better than the January return. On the Rand the daily average yield was in fact higher than in either January or December, figures for the three months being as follows:—February, £90,650; January, £85,215; December, £88,077. The actual return declared by the Transvaal Chamber of Mines on Tuesday was 626,261 fine ozs. of a value of £2,660,186. For January the declaration was 651,753 ozs., value £2,768,470, so that the decrease is 25,492 ozs.

Profits.

As regards profits the various controlling groups record the following figures:—

	December.	January.	February.
Rand Mines:—			
Subsidiaries	£211,158	£225,213	£193,133
Central Mining ...	214,786	214,252	186,900
Barnato group	100,264	87,277	94,055
Gold Fields group ...	77,318	80,531	73,453
Robinson group	75,076	57,630	68.026
East Rand Proprietary...	75,010	50,015	50,292
Albu group	61,547	19,893	51,850
Neumann group	58,656	53,601	46,160
Kleinfontein group ...	21,182	13,573	20,941
Cons. Mines Selection ...	21,869	20,939	16,920
Goerz group	11,156	8,993	9,611
Totals	£928,322	£861,917	£811,341

In this respect, too, it should be noted that on the daily average basis the February earning is better than that of the preceding month, although it is nearly £1,000 below the daily earning during December. In April last a daily average profit of £35,936 was recorded. In July low water mark was registered, the earning being only £21,252. Thereafter there was improvement up to £32,910 per diem in September, but profits per day subsequently declined to £29,946 in December, whilst the January rate was £27,804, and that of last month £28,977. Reverting to the output, it may be remarked that a number of mines "cleaned up" very closely at the time of the strike in January. For this reason the recovery circuit must be replenished before normal returns again obtain, and this, of course, is a further bull point in connection with the February output.

The Labour Position.

The most encouraging feature of all, however, is, without doubt in regard to native labour. It is, of course, not too satisfactory to observe that the gain during February was substantially less than the gain during January, but after all the essential point is that the riot of wastage has been stemmed and that labour figures are now on the upward grade. The great loss of "boys" that has ensued since July last is best illustrated by the accompanying table, which sets forth fluctuations since the commencement of last year:

Month.	Total Natives.	Total Labourers on Gold Mines.	Increase or Decrease on Gold Mines.
1913.			
January	222,791	200,090	+ 8,744
February	230,457	207,662	+ 7,572
March	231,783	207,733	+ 71
April	230,103	205,424	– 2,309
May	222,051	179,644	– 7,780
June	211,808	188,094	– 9,550
July	193,023	170,242	–17,852
August	180,631	158,223	–12,019
September	174,391	152,637	– 5,586
October	170,971	148,782	– 3,755
November	169,535	147,569	– 1,313
December	171,339	150,012	+ 2,113
1914.			
January	175,652	154,202	+ 4,190
February	179,447	157,673	+ 3,471

Twelve Leading Companies.

The twelve leading producers are as follows:—

	Stamps.	Tubes.	Tons.	Value.
Crown Mines	660	24	162,000	£224,301
Randfontein Central ...	860	29	173,178	214,323
East Rand Proprietary	820	25	125,000	191,458
Ferreira Deep	250	7	50,100	97,689
New Modder	180	7	41,500	81,951
Rose Deep	300	7	62,100	78,056
Robinson	250	6	44,700	75,911
City Deep	150	9	34,000	66,118
New Kleinfontein ...	200	4	47,300	63,058
Knights Deep	400	11	82,300	62,582
Simmer and Jack ...	320	7	58,000	61,877
Geldenhuis Deep ...	300	7	41,800	61,071

Increases and Decreases.

The following returns of the February output have been filed with the Chamber of Mines. Increases and decreases compared with January are appended:—

The Witwatersrand.

	Jan. £	Feb. £	Increase. £	Decrease. £
Aurora West	15.041	15.050	9	—
Bantjes	27.164	24.456	—	2.608
Brakpan . . .	65.373	60.560	—	4.813
City Deep .	71.239	66.418	—	4,821
City and Suburban	45.285	45.854	569	—
Consolidated Langlaagte	51.754	50.361	—	1.393
Consolidated Main Reef	26.514	27.716	1.202	—
Crown Mines	249.852	224.301	—	25.551
Durban Deep . . .	31.340	26.846	—	4.494
Durban Roodepoort .	15.101	14.476	—	625
East Rand Proprietary Mines	190.511	191.458	947	—
Ferreira Deep	113.325	97.689	—	15.636
Geduld	28.991	28.184	—	807
Geldenhuis Deep .	64.540	61.074	—	3.466
Ginsberg	17.959	17.067	—	892
Glencairn .	14.863	13.780	—	1.083
Knight Central	27.432	25.928	—	1.504
Knights Deep	60,704	62,582	1,878	—

	Jan.	Feb.	Increase.	Decrease.
	£	£	£	£
Langlaagte Estate	56,631	53,500	—	3,131
Luipaardsvlei	16,337	18,180	1,843	—
May Consolidated	8,763	7.174	—	1,589
Main Reef West	25.894	23,231	—	2,663
Meyer and Charlton	44,474	32.848	—	11,626
Modder B.	58.232	60.352	2,120	—
New Goch	31,816	29.709	—	2.109
New Heriot	21,298	22,296	998	—
New Kleinfontein	54.736	63,058	8,322	—
New Modder	77.470	81,951	4,481	—
New Primrose	28.315	27,432	—	883
New Rietfontein	13.631	12.306	—	1,325
New Unified	14.956	13.822	—	1,134
Nourse Mines	60,798	53.301	—	7,497
Princess	27,891	27,937	46	—
Randfontein Central	201.007	214.323	13.316	—
Robinson Deep	62,985	59.918	—	3,067
Robinson	99.210	75,911	—	23.299
Rose Deep	68,656	78,056	9.400	—
Roodepoort United	22,203	20,398	—	1,805
Simmer and Jack	73,800	61,877	—	11,923
Simmer Deep	40,698	40.464	—	234
Spes Bona	4,596	4,834	238	—
Van Ryn	39,912	46.279	6,367	—
Van Ryn Deep	50,455	56.231	5,866	—
Village Deep	63.707	58,092	—	5.615
Village Main	65.993	55,212	—	10,781
Vogelstruis Estate	12.981	12.926	—	55
West Rand Central	3.305	3.470	165	—
West Rand Consolidated	20.661	26.119	5,458	—
Witwatersrand	46.789	*47.562	773	—
Witwatersrand Deep	61.167	51,631	—	9,536
Wolhuter	37.142	37,151	9	—
Miscellaneous	8.173	6.670	—	1.503
Outside Districts.				
Ceylon	922	943	21	—
Glynn's Lydenburg	8.852	7,620	—	1,232
Nigel	19.935	18,919	—	1,016
Quest	2.931	2,927	- -	4
Sheba	13,066	13,376	310	—
Sub Nigel	10.959	9,167	—	1.792
Transvaal G.M. Estates	39.819	37,125	—	2,694
Worcesters	3.589	3,942	353	—
Miscellaneous	25.648	27,956	2,308	—

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

The Witwatersrand.

Company.	Tons Milled.	No. of Stamps.	Tube Mills.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	12.220	80	—	3,543	15,050
Bantjes Consolidated	20.000	100	3	5.781	24,556
Brakpan Mines	45,030	140	8	14,257	60,560
City Deep	34,000	150	9	15,636	66,418
City and Suburban	24.550	150	2	10,795	45,854
Consolidated Langlaagte Mines	37,800	70	7	11.856	50,361
Consolidated Main Reef	17,460	90	3	6,525	27,716
Crown Mines	162,000	660	24	52,805	224,301
Durban Roodepoort	13.290	90	1	3,408	14,476
Durban Roodepoort Deep	20,490	100	3	6,320	26,846
East Rand Proprietary Mines	125,000	820	25	45,073	191,458
Ferreira Deep	50,100	250	7	22,998	97,689
Geldenhuis Deep	41,800	300	7	14,378	61,074
Ginsberg	13,777	75	1	4,018	17,067
Glencairn Main Reef	18,970	155	—	3,264	13,780
Geduld Proprietary Mines	17,600	50	5	6,635	28,184
Knights Deep	82,300	400	11	14,733	62,582
Knight Central	21,150	100	3	6,104	25,928
Langlaagte Estate	44.194	200	5	12,595	53,500
Luipardsvlei Estate	16.270	60	3	4.280	18,180
Main Reef West	15.430	80	3	5.469	23.231
May Consolidated	9,050	100	—	1,689	7.171
Meyer and Charlton	13.584	75	2	7,733	32,848
Modderfontein B	33,100	80	5	14,208	60.352
New Goch	27.000	120	4	6.994	29,705
New Heriot	12.400	70	1	5,249	22.296
New Kleinfontein	47,300	200	4	14,845	63,058
New Modderfontein	41,500	180	7	19,293	81,951
New Primrose	21,700	155	2	6,458	27.432
New Rietfontein Estate	12,130	110	—	2,897	12.306
New Unified	11,590	60	1	3,254	13,822
Nourse Mines	37.800	260	7	12,548	53,301
Princess Estate	21,200	60	5	6,577	27,937
Robinson	44,700	250	6	17.871	75,911
Robinson Deep	40,700	110	8	14.106	59,918
Randfontein Central	173,178	860	29	50,456	214,323
Roodepoort United Main Reef	23,500	55	3	4,802	20,398
Rose Deep	62,100	300	7	18,376	78,056
Simmer Deep	49,200	180	9	9,526	40,464
Simmer and Jack	58,000	320	7	14,567	61,877
Spes Bona Tribute	4,548	40	—	1,138	4,834
Van Ryn Deep	34,200	70	8	13,259	56,321
Van Ryn Gold Mines	35,000	135	6	10,895	46,279
Village Deep	43,100	180	7	13,676	58,092
Village Main Reef	30,560	220	5	12,998	55,212
Vogelstruis Estates	11,243	70	—	3,043	12,926
West Rand Central	1,908	20	1	817	3,470
West Rand Consolidated	22,000	100	4	6,149	26,119
Witwatersrand	38,410	215	4	11,197	47,562
Witwatersrand Deep	37,910	245	4	12,155	51,631
Wolhuter	29,400	120	4	8,746	37,151
Miscellaneous Producers	—	—	—	—	6,670
Outside Districts.					
HEIDELBERG—					
Nigel	12,000	75	1	4,454	18,919
Sub Nigel	4,390	25	1	2,158	9,167
BARBERTON—					
Sheba	6,240	65	-	3,149	13,376
Worcester Exploration	4.900	40	2	928	3,942
LYDENBURG—					
Ceylon Lydenburg	637	5	—	222	943
Glynn's Lydenburg	3,452	20	1	1,794	7,620
Transvaal G.M. Estates	13,245	75	3	8,740	37,125
KLERKSDORP—					
Quest	4,267	35	—	689	2,927
Miscellaneous Producers	—	—	—	—	27,956

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of February:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	62,100	16/ 4	18.376	£26,105
Geldenhuis Deep	300	7	41,800	24/ 7	14,378	8,814
Nourse Mines	260	7	37,800	23/ 0	12,548	8,927
Ferreira Deep	250	7	50,100	18/ 2	22,998	51,068
Crown Mines	660	26	162,000	15/ 6	52,805	96,164
Durban Rood. D.	100	3	20,490	23/10	6,320	2,055
Totals & averages	1870	57	374,290	18/ 2	127,425	£193,133

Nourse Mines.—Decreased profit due to reduced tonnage, owing to severe labour shortage and lower yield caused by close clean up in January.

Crown Mines, Ltd.—Profit low, owing to low recovery, which is directly due to the close clean up of reduction works at the time of the strike in January.

Durban Roodepoort Deep, Ltd.—Reduced profit is mainly due to lower yield caused by close clean up in January.

The following are the results of crushing operations of central mining companies for the month of February:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	33,100	15/ 6	14,208	£33,910
New Modder	180	7	41,500	16/ 5	19,293	36,998
City Deep	150	9	34,000	25/ 1	15,636	22,777
Village Deep	180	7	43,100	18/11	13,676	16,485
Village Main Reef	220	6	30,560	18/ 6	12,998	26,015
Robinson	250	6	44,700	15/ 8	17,871	39,767
Bantjes	100	3	20,000	23/ 3	5,781	948
Totals & averages	1160	43	246,960	18/ 7	99,163	£186,900

Village Main Reef, Ltd.—The return for the month of January was unusually high on account of the close clean up. Grade of ore milled in February is normal. Mine is suffering from want of labour.

Robinson Gold Mining Co., Ltd.—The reduced profit is due to smaller tonnage milled, owing to loss of a number of boys during the month, and to lower yield caused by close clean up in January.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of February, 1914:—

	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	9,050	£7,159	*£380
Princess Estate ...	60	5	21,200	27,869	2,013
Geduld Proprietary ...	50	5	17,600	28,114	7,601
	210	10	47,850	£63,142	£9,614

* Net loss.

The loss is due to a shortage of native labour, but the position in this respect is improving.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of February, 1914, of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	58,000	15,067	£28,730
Robinson Deep ...	110	8	40,700	14,106	25,494
Knights Deep ...	400	11	82,300	14,733	13,630
Simmer Deep ...	180	9	49,200	9,141	3,004
Sub Nigel	25	1	4,390	2,158	2,595
Totals	1035	36	234,590	55,205	£73,453

Total gold in reserve:—Simmer and Jack, 3,250 ozs.; Robinson Deep, 2,357 ozs.; Knights Deep, nil; Simmer Deep, 1,660 ozs.; Sub Nigel, 900 ozs.; total, 8,167 ozs.

The sundry revenue included in the above total declared profits is as under:—Simmer and Jack, £2,500; Robinson Deep, £1,489; Knights Deep, £1,353; Simmer Deep, £488; Sub Nigel, £424; total, £6,254.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	37,910	£51,200	£18,009
Wolhuter	29,400	36,732	11,007
Consolidated Main Reef...	17,460	27,344	7,695
Main Reef West	15,430	22,932	4,489
Knight Central	21,150	25,644	4,960
Total for Group ...		£163,852	£46,160

In addition to February being a short month, the tonnage of Wit. Deep and Main Reef West was affected by shortage of native labour, and in the case of Main Reef West, this was accentuated by a skip accident in the east shaft, which caused some delay.

Nigel G.M. Co.

The returns from this company's mine for February are are follows:—Tons milled, 12,000; gold recovered, 4,451 fine ozs.; profit, £3,340; stamps working, 75. There has been no rain at the mine for months, and owing to the scarcity of water 20 stamps and the tube mill have had to be placed out of operation.

Barnato Group.

The following are the operations of the Barnato Group for the month of February:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.	Gross Profit including sundry Revenue.
Cons. Langlaagte ...	70	37,800	£50,363	£20,025
Ginsberg	75	13,777	17,070	4,335
Glencairn	155	18,970	13,781	2,374
New Primrose	155	21,700	27,431	13,465
New Rietfontein ...	110	12,130	12,305	262
New Unified	60	11,590	13,825	4,868
Quest	35	4,267	2,927	802
Van Ryn Deep ...	70	34,200	56,320	25,429
Witwatersrand	215	38,410	47,561	22,495
February totals .	945	192,884	£241,583	£94,055
January totals .	925	197,278	241,659	£87,277

Monthly gross profits: January, £87,277; February, £94,055.

The Albu Group.

The following are the details of results regarding the February operations of the producing mines of the General Mining and Finance Corporation Group:—

Company.	Stamps.	Tons Crushed	Total Cost.
Aurora West	80	12,220	£13,099
Meyer and Charlton	75	13,584	12,220
New Goch	120	27,000	22,250
Roodepoort United	55	23,500	20,437
Van Ryn	135	35,000	27,452
West Rand Consolidated ...	100	22,000	23,165
	565	133,304	£118,623

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	21/ 5·3	£15,024	£1,925
Meyer and Charlton	17/11·9	32,768	20,548
New Goch	16/ 5·8	29,631	7,381
Roodepoort United	17/ 4·7	20,455	18
Van Ryn	15¾ 8·2	46,303	18,851
West Rand Consolidated ...	21/ 0¼7	26,292	3,127
		£170,473	£51,850

Robinson Group.

The following is the result of operations of the Robinson group for the month of February:—Langlaagte Estate. 44,194 tons milled; yield, 12,595 fine ozs.; profit, £13,010. Randfontein Central, 173,178 tons milled; yield, 50,456 fine ozs.; profit, £55,016. Estimated profit per ton: Langlaagte Estate, 5s. 10·65d.; Randfontein Central, 6s. 4·25d.

East Rand Proprietary Mines.

The following is the text of a cablegram despatched to the London office of the E.R.P.M. this week:—"The following are the results of last month's operations: 820 stamps milled 125,000 tons; 45,073 ozs. fine gold recovered, valued at £189,208, including 2,224 ozs., valued at £9,342, recovered from the accumulated slime. Profit for the month, £50,292, including £7,219 profit from treatment of accumulated slime."

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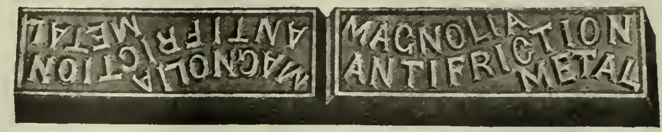

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Engineering Notes and News.

PROGRESS OF THE SOUTH AFRICAN INSTITUTE OF ELECTRICAL ENGINEERS.

Presidential Address by Mr. W. Elsdon Dew.

On his election as President of the S.A. Institute of Electrical Engineers, Mr. W. Elsdon Dew, at the last meeting, delivered the following address:—Allow me to express my thanks and appreciation for the great honour you have done me in electing me President of your Institution. Naturally, a professional man appreciates to a much greater extent the judgment of his peers, rather than that of those who are unacquainted with his work and the landmarks of his career. No greater honour can be conferred on anyone than to be elected to the chair, and I hope, with your help, that I shall not be found wanting during my term of office. I have given the matter of my speech some consideration, and hope you will appreciate my difficulty. Knowing, as I do, that it is often expected of a new President that he should give some statement of the latest progress made in connection with the profession, yet I am not doing so, but shall address you on a matter that I feel very strongly about. I feel that this is a very opportune moment to speak on the work of the Institute, and appeal to all engaged in electrical engineering to take up this matter seriously. I am not pleading in a forlorn hope, for, if you will consider for a few minutes what is the reason for the existence of technical institutions, you will agree with me that this Institute, which is now a lusty member among the technical societies of South Africa, has already, in its short existence, justified itself. The status of the profession of electrical engineering in South Africa for many years suffered under certain disabilities; but I shall not detail these, as they are now past, and we have the future before us, which is in our making. By the advice and information given by your Institute during its short career to the Government and others, the advancement of the profession has been assured; but there still remains a lot of pioneer work to be done. As you are aware, great things come from small beginnings, and the foundation members of this Institute will feel proud that they have had the opportunity and the honour to start this technical society in South Africa. The work of the Institute we are now doing is the foundation that will support in the future—let us hope not in the very far future—such an edifice of learning and knowledge that we may well be proud that we are privileged to do this. We have the advantage of utilising the experience gained by the older technical institutions now flourishing throughout the world, which are filling important parts in the progress of engineering generally. By following on such lines as the older institutions have inaugurated, it must follow that we shall be able to do similar good work for the profession in South Africa. (Applause.) We have the examples of such great men as the late Lord Kelvin, the late Sir Wm. H. Preece, Professor Ayrton, and others too numerous to mention, all of whom have devoted their energies and work to furthering the interests of their professions. I do not fear, therefore, that whatever difficulty may arise, we shall overcome same and continue the good work so well begun, if we follow the example set us by all the great men of the world. I may remind you that the late Sir Wm. H. Preece said, on his visit here two years ago, that he considered we were well advanced in electrical engineering; in fact, he said, in some respects we led the world; and, gentlemen, it behoves us, therefore, that this Institute should, in like manner, fulfil the objects for which it was founded, in justification of this statement and, if not exactly in leading, still, by continued and sustained effort, further the interests of the profession in South Africa, and, by studying the conditions, this Institute will be able to assist and direct in many ways the progress of electrical engineering. Consider our environments: we are situated in practically a new country, with vast undeveloped wealth, and it is not for a moment doubted, even by the worst pessimist, but that the potentialities for progress are great. You will remember what the Hon. F. S. Malan said in his speech at the Institute's dinner in December: "The electrical engineer is associated and mixed up with every phase of the country's development." The possibilities for the advancement of electrical engineering are great, and no one knows this better than those actually engaged on such work. We may well be proud of electrical work already so well done in the country. Take a few

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instances. Power supply is, I suppose, as important as any; the Victoria Falls and Transvaal Power Supply Company, Limited, with its associated company—the Rand Mines Power Supply Company, Ltd.—these are as important as any power schemes in the world. Take compressed air supply. Are there many such important schemes as we have here? What country in the world has studied and developed the question of electric hoisting as we have here on the Rand? (Applause.) Take the telephone system of this town. Is it not comparable with all? And even in the last few days we have had developments in wireless telegraphy, which will no doubt be far reaching; and who will say that the future developments in this country's resources in coal, water, power, etc., are not infinite? The Institute would, indeed, be doing a great work if it were to compile all the important information of details, alterations, and reports that are made of the general workings of these and other concerns; and I make bold to say that such a record would be a work of reference for use by all the world, and which would be unsurpassed, if compiled in the usual manner, for reference as the latest progress in the actual operation of machinery. Gentlemen, are we not justified in feeling that this Institute has a great field of work before it? And I can only ask you to study the objects for which this Institute has been founded: and each one of you will find among these objects some indication in what direction you should give your assistance to advance your profession. Every engineer realises that whether he is civil, mechanical, electrical, or any of the other branches of engineering, this country specially calls for practical results: and we may well be proud of what has been accomplished. During the practical application of engineering appliances, the experience and ideas of those engaged on the work is of great value: and those who have taken the trouble to place on record the knowledge thus gained have done good service to the profession. It is evident that this country has already supplied most useful information about machinery, that has been used by the manufacturers to improve their products. It has been said that this country, owing to the conditions prevailing, is unfortunate in not having the facilities for theoretical research, as obtains in other countries. This is only temporary, I hope, for technical education is receiving special attention, and as this country advances we shall be able to get the benefit of such research work as goes with all manufacturing concerns. It is necessary that factories should be established before we have much independent theoretical research; but this is only a matter of time, and I may be allowed to say that I consider this country has every possibility for establishing factories for many of the manufactured articles now being imported. Is not electrical engineering to be closely associated with such developments? The members of your Institution are representative of all branches of electrical engineering, and the Council you have elected is also representative in this way; and therefore, gentlemen, you may feel assured that your interests and the interests of all the members will be safeguarded as far as the Council can do so. Gentlemen, allow me to call your attention to some of the duties you owe to the profession to which you have the honour to belong. Intellectually or Technically.—It is without doubt your duty to devote a little of your time to the work of the Institute, and by imparting to your fellow-members some of your knowledge and experience you will ensure the advancement of the Institute in every way. We may be considered all busy men; but do not use this as an excuse against your opportunities. Financially.—I do not wish to dwell on this, but you know that in fulfilling promptly your obligations to the Institute you will so greatly assist your Council that the work can be carried out with greater efficiency and allow for greater scope to the ever-widening influence that your Institute is attaining. Socially.—I need hardly remind you that it is always necessary to foster a fellow feeling of esprit de corps, so that all petty differences and jealousies are sunk, and to strive after the highest ideals, so that the aggrandisement of your Institute is assured, for in this Institute's prosperity lies the success of electrical engineering in South Africa.

Electric Blasting in Shafts with Delay Action Exploders.

(By C. W. MORSE.)

Blasting with electricity in shaft-sinking is not receiving the attention it deserves. The principal reason seems to be that comparatively few mine superintendents and engineers are familiar with the delay-action exploders as perfected by the California Cap Co. The largest powder company in the United States attempted to perfect such an exploder, but was not entirely successful. Shaft-sinking is an anxious period with most of us, and anything that will render it less dangerous is surely welcome. The delay-action exploder is something that many of us have hoped for. These exploders were used in sinking the South Jackson shaft, at Jackson, Amador County, California. The superintendent, Jeffrey Schweitzer, reports that they were most satisfactory. Jack Collier tried them later at the Sultana Mine, at Grass Valley, with equally good results. The exploders are made up with an electric fuse igniter, a short length of time fuse, and a detonator, all contained in

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a waterproof covering. They are made in ten periods; the different periods being obtained by varying the lengths of fuse. The longest will go into the regulation stick of powder. They can be obtained with any length of wires. In blasting in a wet shaft, current should be taken from the light circuit, as there are many sources of leakage and the ordinary blasting machine will not supply sufficient current. Two wires are brought from the light circuit to a small box which should contain fuses of lower amperage than those on the light circuit, a knife switch opening down and held open with a weight or spring, and two binding posts; an indicator lamp is convenient. This box should have a lock for which the blaster only has a key, and should be placed near the collar of the shaft or at a convenient station. Nearby is a reel for holding and playing out a No. 10 encased cable. The inside end of the cable is left protruding sufficiently to permit its being connected to the binding posts when the box is opened. The cable reaches to within a few inches of the bottom of the shaft, and to each of its two wires a length of bare telephone wire is attached and placed horizontally across the shaft, being kept off the bottom with blocks of wood. To these wires the exploders are attached in parallel by the insulated wires with which each is supplied. In loading the holes the first delays are, of course, used in the cut holes. For most work, five periods of delay are all that are required. When the men, including the blaster, reach the surface, the blaster unlocks the box, connects the ends of the cable to the binding posts, and throws the switch. At the South Jackson, they took the additional precaution to have a break in the cable, the ends being held together during the blasting. All miners can recall many horrible accidents that would have been avoided by the use of this method of blasting, and not only are accidents avoided, but the fumes are also done away with, and the air in the shaft is rendered less fould by the round.

Finance, Commerce, and Industries.

Standard Bank Position.

The Joint General Managers of the Standard Bank of South Africa, Ltd., are in receipt of cable advice that the directors propose to recommend to shareholders at the general meeting to be held on April 22 next, the payment for the half-year, ended December 31, 1913, of a dividend at the rate of 10 per cent. per annum, and a bonus at the rate of 4 per cent. per annum, making a total distribution to shareholders at the rate of 14 per cent. per annum, subject to British income tax. It is further proposed to add £10,000 to reserve fund, making it £2,000,000; to appropriate £25,000 for the purpose of writing down investments below market value as at December 31 last; to write down bank premises by £15,000; and to add £10,000 to the Officers' Pension Fund. A balance of about £52,000 will be carried forward to next half-year's account.

* * * *

Finances of the Union.

Figures published in the "Government Gazette" revealed much interesting information regarding revenue collections of the four Provinces. The period embraced was from April 1st, 1913, to January 31st, 1914. In that time the total revenue accruing from all Provinces was £1,103,380 11s. 8d. And of that sum the Transvaal's share was £510,274 7s. 9d., or a small fraction under 50 per cent. The Cape's figures was £347,468 8s. 1d., while the Free State was next with £145,376 5s. 1d., and Natal last with £100,270 0s. 9d. On the estimates the totals, excepting in the case of the Cape, were disappointing. In the aggregate it was expected that a sum of £1,211,000 would have been realised, but this fell short by £107,620. For this the Transvaal could be blamed, the premier Province's revenue falling short of the estimate by no less a sum than £126,726. The Cape cleared her estimate and was left with a surplus of nearly £20,000. Natal was £5,000 under the mark, and the Free State about £1,300. It must be pointed out, however, that the revenue figures only embrace ten months, and the estimates, being simply given as "for 1913-14," might be presumed to run to a full twelve months. This would, therefore, make comparisons as between revenue and estimates useless at this stage. A big slice of the Transvaal's income came from pass fees, no less a sum than £282,736 14s. going under this head. The entertainment tax in the Cape realised £1,947 15s. 9d. The tax on totalisators gave the Transvaal £24,486, but the Cape only drew £3,119 in this direction, and the other Provinces nothing at all. Motor-car licences in the Cape produced £11,745, but only £926 was realised in the Transvaal. This sum, however, was only raised in January, when the new Motor Ordinance came into existence.

* * * *

Pretoria Portland Cement.

At the annual meeting of the Pretoria Portland Cement Co., Mr. H. C. Boyd, in moving the adoption of the report, said, inter alia:" I have much pleasure in submitting for your approval the directors' report and accounts for the year ended 31st December, 1913. The Company has again had a prosperous year, the net profit of £74,299 0s. 9d. being only £2,240 less than the profit for 1912, a very satisfactory result when we bear in mind the conditions which prevailed during the latter half of the year under review, following on the industrial disturbances in July. Our sales were materially affected from then till December, when a marked revival took place. In arriving at the above profit, the usual adequate allowance for depreciation has been made and our holding in Concrete Construction Company shares has been written down to a nominal figure. It may almost be claimed that this item has been dealt with somewhat drastically, but I think you will agree that it is well to err on the side of safety. The demand for the chief product of that company, concrete pipes, is at present very limited; standing charges have been cut down to a minimum and the small business that is being done is more than covering expenses. We can but hope that before long there will be a change for the better in that company's affairs. Two dividends of 20 per cent. each absorbing £60,000 were declared during the year; £15,000 were placed to the reserve fund, which now stands at £50,000, and £12,946 15s. 4d. were caried forward to the next account, a slightly smaller amount than that brought forward at the beginning of the year. In the latter part of the year we somewhat altered our methods of distributing our cement in the other Provinces, a change which has had most gratifying results. It is also interesting to note that while at one time we relied mainly on the industrial centres for consumers, our business is now growing considerably in outside districts, a large quantity of our cement going to farmers, while several important contracts for irrigation works have been secured in the Cape Province. The Chairman referred last year to the extension of the areas in which our product was being used, and I am glad to be able to report that, owing to the facts just mentioned and to reduction in our selling price, there has been further very material extension during the past year. A fair business has been opened up in Rhodesia, and it may be said that we are now able to compete satisfactorily with the imported article virtually throughout the whole of the Union. Satisfactory contracts are running with the Government and the Railways, and with Pretoria, Johannesburg and other important Municipalities. An all-round reduction in our selling prices was made in January which, it is confidently expected, will further increase the demand, and place us in a strong position to hold our own under any circumstances."

For quite a good while past we have been hearing of a revival of interest in certain gold reefs traversing this district and more particularly in the Nigel Extension, which is known to cross the Rensburg township and run down the Blesbok River, passing a little north of Emmasdale Industrial School, says the *Heidelberg News*. The securing of options along the line, we are told, has been going on, and the sleepy quiet of Heidelberg may at any time be aroused by the arrival of an army of gold seekers

Crown Diamonds.

The following results attended washing operations at the Crown Diamond Mine for the month of February, 1914 — 20,801 loads washed, yielding 2,027 carats of diamonds.

THE WEEK IN THE SHAREMARKET.

Dull and Easier During Week—Improving at Close.

The market has been disappointing again this week. Until Thursday, when a rise in East Rands caused some interest, things were unusually quiet. Several stocks have dropped back in the past few days. Brakpans were slightly easier, and other Far East Rand shares were also down. Complications in Brazil and Mexico are said to be the depressing factor in London, but it is difficult to see why the South African market should suffer for it. Tins and diamonds are still weak on an unsatisfactory market for both products.

	Fri. 6th.	Sat. 7th.	Mon. 9th.	Tues. 10th.	Wed. 11th.	Thur. 12th.
Adair-Ushers.	0 4*	0 4*	0 3*	0 4*	0 3*	0 4*
Apex Mines	19 3*	19 0*	19 0*	19 0*	—	18 3*
African Farms	14 3*	14 0*	14 0*	13 6*	13 9*	13 3*
Bantjes Cons....	14 0*	14 6	13 9*	13 9*	13 9*	13 9
Benoni Cons.	1 10*	1 10*	1 10*	1 10*	1 10*	1 10*
Blaauwbosch	85 0*	—	85 0*	—	90 0†	—
Brakpan Mines	51 0*	—	50 0*	48 9†	—	45 6*
Breyten Collieries ...	28 6*	29 0*	30 0†	29 0*	29 0*	28 6*
British S.A....	18 6*	18 0*	18 0*	—	—	—
Bushveld Tins	0 6*	—	0 8*	0 9*	0 9*	0 10
Cassel Coals	14 0	—	14 0*	—	—	13 0*
Cinderella Cons.	5 6*	—	6 6†	5 0*	5 6*	5 6*
City and Subs.	43 0*	43 0*	43 3*	43 6*	44 0	43 6*
City Deeps	60 0*	61 0†	60 0*	61 0†	59 0*	58 3*
Cloverfields	4 10*	4 6*	4 6*	4 7*	4 9†	4 6*
Clydesdales	9 6*	9 6*	9 3*	10 3	—	—
Concrete Construct. ...	2 0*	—	2 0*	—	—	—
Con. Langlaagtes ...	29 3*	29 0*	29 0*	29 0*	29 0*	29 0*
Con. Main Reefs.. ...	17 6*	17 3*	17 3*	17 6*	17 9*	17 6*
Con. Mines Selection	8 0*	8 0*	—	8 0*	8 0*	9 6*
Coronation Colls. ...	21 0*	21 0*	—	—	—	—
Coronation Freeholds .	0 4*	0 4*	0 6†	0 5*	0 4*	0 4*
Coronation Synd.	—	—	—	—	3 6†	3 0*
Crown Diamonds ...	8 3	8 3	8 3*	8 3*	8 3*	8 3*
Crown Mines Deb. ...	£98½*	—	£98*	£98*	£98*	—
Doornhoek Tins	2 0	—	2 0†	2 0†	—	1 0†
East Rand Centrals ...	2 6*	2 6*	2 0*	2 0*	2 0*	2 0*
East Rand Coals. ...	1 7*	—	1 7*	1 6*	1 7*	1 7*
East Rand Deeps. . .	1 6*	1 8*	1 7*	1 6*	1 6*	1 6*
East Rand Props. ...	40 0*	39 9	39 0*	38 0*	—	36 0*
East Rand Debs. ...	£83½	—	£85*	£85*	£85*	£85*
Eastern Golds	1 3*	1 2*	1 6†	1 1*	1 2*	1 1*
Frank Smiths.	5 9*	5 6	5 3*	5 5	5 4*	5 6
Geduld Props.	23 9*	23 6*	—	24 0*	24 0*	—
Glencoe Colls.	6 6*	—	—	6 9*	6 9*	—
Government Areas ...	19 6*	19 6	19 3*	19 0	19 0*	19 0*
Joh. Bd. of Ex.	—	—	—	25 0†	—	—
Kaalfontein	0 3*	0 3*	—	—	—	0 6†
Kleinfontein Est. ...	22 6†	22 6†	22 6†	22 6†	—	—
Klerksdorp Props. ...	2 5*	2 5*	2 4*	2 4*	2 3*	2 4
Knight Centrals.. ..	10 2	9 10	9 9*	9 8	9 9	9 9
Knights Deeps	34 0†	—	—	—	34 0†	—
Lace Props.	3 1*	3 1	3 0	2 11*	2 9*	2 11
Luipaardsvlei Est.	9 9*	9 9*	9 6*	9 6*	9 6*	9 6*
Lydenburg G. Farms	2 9*	2 10*	2 10*	2 10*	2 10*	2 10*
Main Reef Wests .	8 0*	8 6	8 0*	8 0	8 0*	8 0*
Middelvlei Estates ..	1 1*	1 0*	—	1 3†	1 0*	1 0*

*Buyers. †Sellers.

	Fri. 6th.	Sat. 7th.	Mon. 9th.	Tues. 10th.	Wed. 11th.	Thur. 12th.
Modder Deeps	42 6*	42 3	41 6*	41 6	41 9*	41 3
Natal Navig....	15 0*	—	—	15 0*	15 0*	—
New Boksburgs... ...	—	—	—	0 6*	—	0 6*
New Eland Dias. ...	27 0*	27 6*	27 0*	27 6	27 6*	27 6*
New Era Cons.	6 0*	7 0†	5 6*	5 9*	6 0*	6 6†
New Geduld Deeps ...	1 10*	1 10*	1 10*	1 10*	1 11	1 11
New Heriots	—	45 0*	—	—	45 0*	48 9*
New Kleinfonteins ...	24 3*	24 3	24 6†	—	23 6*	23 0*
New Modderfontein .	240 0*	—	—	—	240 0*	—
New Rietfonteins ...	2 6†	2 6	2 3*	2 3*	2 3*	2 3*
New Unifieds	15 6†	—	—	—	14 6*	—
Orange Diamonds ...	1 7	1 6*	1 6*	1 6*	1 6*	1 6
Pigg's Peak	9 6*	9 6*	9 6*	9 6*	9 6*	9 6*
Pretoria Cements. ...	46 0*	46 0*	46 6*	46 6*	46 6*	46 6*
Princess	5 0*	5 0*	5 0*	5 0*	5 0*	5 0*
Rand Klips	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Rand Nucleus	1 9*	1 9*	2 0†	1 9*	1 9*	1 9*
Randfontein Deeps ...	—	3 8*	4 0†	4 0†	—	—
Randfontein Estates .	22 0*	—	—	21 0*	—	—
Robinson Deeps	30 0†	—	—	—	—	—
Rooiberg Minerals ...	24 6*	25 0	25 3†	25 0	25 0†	25 0*
Ryan Nigels	—	—	—	3 0*	3 0*	3 0*
Simmer Deeps.	—	—	—	—	—	2 0*
Shebas	5 0*	—	5 0*	5 0*	5 0*	5 0*
S.A. Breweries	41 0†	41 0†	41 0†	—	41 0†	—
S.A. Diamonds	30 0*	30 0*	30 0*	30 0*	30 0*	—
S.A. Lands	3 1*	3 1*	3 0*	3 0*	3 1*	3 1*
Springs Mines	14 3†	—	12 6*	13 0	13 6	13 6*
Sub Nigels	12 6	12 3*	12 6	12 0	12 0*	11 9*
Trans. Coal Trusts ...	34 6†	32 6*	34 6†	34 0†	31 6*	30 6*
Trans. G.M. Est. ...	44 0*	44 0*	—	—	45 0	42 0*
Tudors	1 0*	2 0†	—	—	—	—
Van Ryn Deeps.	42 6	42 6	41 6	41 6	41 9	41 0*
Village Deeps.	33 0*	33 0*	—	—	32 9*	33 0*
Vogel Con. Deeps ...	—	—	—	—	1 0*	1 0*
West Rand Estates ..	—	—	2 6†	—	—	—
Witbank Collieries ...	45 0*	44 6*	—	44 0*	—	44 6*
Witwatersrands	66 6*	66 6*	66 6*	—	—	65 0*
Wit. Deeps	51 0*	51 9*	—	49 6*	50 0*	50 0*
Wolhuters	14 0*	13 9*	13 6*	13 3*	14 0*	14 0*
Zaaiplaats	30 0	30 0†	28 0*	28 0*	29 0	28 0

*Buyers. †Sellers.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

March 14.—Sakalava Madagascar Prop. Oil Fields (Annual); Do. (Extraordinary).
March 16.—Robinson; Crown Mines (special).
March 18.—Anglo-French Coal Estates (annual).
March 20.—Apex; New Kleinfontein; Benoni Consolidated (special).
March 27.—Simmer Deep; Jupiter (annual); Wolhuter Gold Mines; Buck's Reef (annual).
March 31.—Cassel Coal Co. (annual).
May 20.—Apex Mines, New Kleinfontein (Annual).
June 23.—Transvaal Consolidated Lands (annual).

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Specially recommended for Bearings of all sorts, Crushers, Locomotive Axle Boxes, etc., etc.

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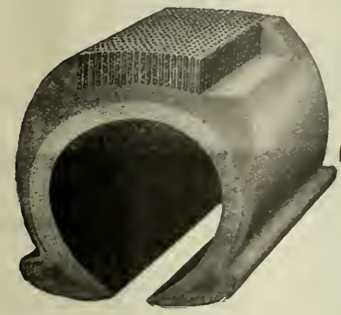

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Motor Cycle
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TYRES GO WRONG only in Two places.

—— The Tread and the "Walls." ——

Use **Stelastics,** which alone have absolutely cut-proof and practically puncture-proof treads.

Stelastics are the only tyres holding the R.A.C. Certificate for 5,000 miles without cut or puncture.

Use **Stelastics,** keep them pumped up to the pressure stated by the makers, and the walls will not break.

Whatever tyres you use give them a chance.

Keep them pumped to pressure.

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COMMERCIAL EXCHANGE BUILDINGS,
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JOHANNESBURG.

AUTOMOBILE NOTES.

An automobile club has been formed at Kimberley, called the Griqualand West Auto Club.

* * * *

If South Africa were possessed of good roads connecting the inland centres of population with the seaports and coast districts, the anxiety and dread which the threat of a general strike created throughout the country in the recent crisis would have been much modified, says the *Cape Times*. It is estimated that there are over 2,500 motor cars, besides motor cycles and motor lorries, in the country, but the fact that the roads are in the main impracticable for motor traffic reduces the usefulness of these vehicles in the service of the State, during periods of emergency, to a minimum. It is not suggested that motor-cars could take the place, even temporarily, of the railways, but they could do much to keep open the lines of communication, and even to facilitate the transport of troops.

* * * *

Motorists will welcome the information that a new and important source of petrol supply has been discovered at Tampico on a property belonging to the Shell Company. While it is not likely that the new discovery will have the effect of reducing the cost of petrol, it may, at any rate, tend to check the advance in price for a period.

* * * *

The suitability of convict labour in road building has long been recognised in South Africa, and the majority of our principal mountain passes owe their construction to this class of labour. As a rule, however, it is only long-sentence prisoners who are so employed, and we venture to suggest that an extension of the system, whereby all able-bodied prisoners in the country districts could be utilised in the improvement of the national highways, would be the most fit and proper work upon which they could be employed.

* * * *

Heavy commercial motor lorries and similar vehicles should be compelled to keep to the left-hand side of the road. Invariably they take possession of the middle, where, owing to the noise and rattle of their movement, the driver cannot hear the horn of the car which is attempting to pass. There are generally two men on board, but instead of one keeping a rearward look-out, the pair are usually to deeply engaged in gossip to pay attention to anything but what falls immediately under their notice to the front. If there is no regulation whereby the Police can enforce this rule of the road, the authorities would do well to supply the omission.

* * * *

The judge's report on the motor lorry trials, held at the Rosebank Show on 26th February, states that the following cars competed: Dennis, 30 cwt. capacity, 1.85 tons load carried; Mass, 3 tons, 2.74 tons; Karrier, 4 tons, 2.8 tons; Leyland, 5 tons, 2.76 tons. The marks awarded were as follows: 1st, Dennis, 92 points; 2nd, Mass, 79.5 points; 3rd, Leyland, 77 points; Karrier, 70 points. The work done by all the lorries was on the whole good, no serious accident or breakdown occurring to mar the performance of any of the competitors. The two heavy machines (Karrier and Leyland) would have made better scores if they had carried their full load and kept the speed down. The Leyland in particular would have improved its petrol consumption considerably if the full 5 tons had been carried. Taking the machines in order of merit, the performance of the Dennis reflected great credit, not only on the machine itself but on those concerned in the tuning and in the running. The Mass tractor scored by means of its very efficient radiator and cooling arrangement. With regard to the principle of the front wheels being the driving wheels, the judges are not prepared to give any report on this, as it would require a much longer and more strenuous test to judge this. As remarked before, the Leyland lorry was handicapped by its small load. For such a large lorry it is particularly easy to handle, and the judges would like to call special attention to this point. The Karrier machine was unfortunate in losing its fan belt early in the trial, and with some tuning and practice much better results could be obtained. The point of interest in this machine was the provision of a special arrangement for loading, which could also be used for hauling the machine out of drifts, etc. if necessary. This was duly noted, and in future trials more marks will be allotted to devices of this kind. It should be said that this machine only arrived from the makers three days before the trials, during which time a body had to be built on: this may, to some extent, account for its lack of readiness. In general more time ought to have been spent in getting the machine into first-class tune before the trials. The judges were Messrs. Duncan McMillan, A.R.T.C., A.M.I.Mech.E., Frank C. Wright, A.M.I.Mech.E., and John G. Rose.

The Week's Company Meetings.

ROBINSON GROUP.

LANGLAAGTE ESTATE.

Temporary Decrease in Grade.

The twenty-third ordinary general meeting of shareholders in the Langlaagte Estate and Gold Mining Company was held in the Board Room, Mayfair on March 9. Mr. J. H. Crosby vice-chairman, presided, and there were present personally and by proxy, Messrs. N. J. Scholtz, C. A. Ferguson, W. H. Crawford, J. H. Tiley, Sir Joseph Robinson, Bart., The Randfontein Estates Gold Mining Co., Witwatersrand, Ltd., and J. C. K. Pollock, secretary. Shares represented personally and by proxy totalled 201,855. The directors' report, statement of accounts, manager's report and mechanical engineer's report, for the year ended 31st December, 1913, were laid on the table and taken as read.

The Chairman's Speech.

The Chairman, in formally moving the adoption of the statement of accounts and reports, said: Your property and capital are unchanged. The mill of 200 stamps ran for 344 days, 620,622 tons were crushed, and the yield of fine gold was 160,366 ounces. Revenue amounted to £675,274 (21s. 9.13d. per ton milled), expenditure to £530,391 (17s. 1.11d. per ton milled), and profit to £144,883 (4s. 8.02d. per ton milled). The amount derived from estate account (£17,808) was added to this, and £162,691 carried to appropriation account. £45 for dividends received was brought into this account, and the tota of £162,736 was appropriated as follows: dividends totalled 10 per cent. or £88,650, capital expenditure £34,774 (including £9,549 spent in 1912, not then appropriated, as per directors' report for that year), profits tax £7,286, licences, rates, taxes and audit fees £8,261, contributions under the Miners' Phthisis Act £11,655, bewaarplaatsen leased from Government £4,784, strike account £2,027, sundries £793. The unappropriated balance is thus £4,542. From causes dealt with later, tons milled show a decrease of 14,731. Revenue (excluding estate account) shows a decrease of £57,936 or 1s. 3.83d. per ton milled, and profit (excluding estate account) is less by £23,162 or 7.45d. per ton milled. Our efforts to overcome unfavourable factors were successful to the extent that working costs were decreased by £34,777 or 8.38d. per ton milled. The drop in revenue of nearly 1s. 4d. per ton is attributable to the poorer grade obtained from the estate section, which is nearing the end of its life, and an appreciable improvement will in all probability be shown when the Estate section is finally worked out and the Block B section is supplying the whole of the requirements of the mill.

Development Pushed Ahead.

Development has been vigorously pushed ahead, despite the drawbacks attendant on the white and native labour conditions, and the following work was done: 401 feet of shaft sinking, 12,866 linear feet of crosscutting, rising, driving, winsing, etc., and 15,500 cubic feet of stations, rock boxes, etc. The manager's report, presented herewith, shows that at the 31st December the ore reserves amounted to 1,512,359 tons, i.e., 846,020 tons and 666,339 tons of main reef and south reef respectively. Machinery and plant have been well maintained, and considerable additions have been made during the year.

The scheme drawn out to enable the Block B section to supply the mill with an increased tonnage corresponding to the gradual falling-off of the ore from the Estate section is being well and cheaply carried out, and when it becomes no longer possible to work the Estate section profitably the Block B one will be amply equipped both underground and on the surface, to maintain the tonnage called for Dividends of 7 per cent. and 2½ per cent. were declared in June and December respectively.

Native Labour and Operations.

Native labour fell away considerably during the second half of the year, and our operations were very much interfered with in consequence. The favourable season from a farming point of view militated against the natives seeking work in the usual numbers, but there is reason to believe that more normal conditions will prevail during the coming year. The general strike of white miners in July, and the persistence throughout the remainder of the year of the spirit then engendered, also adversely affected us. A salutary lesson seems to have been taught, however, by the complete measures taken by the Government to deal with the outbreak of unrest which occurred six months later, and I do not anticipate further trouble in the near future on this score. It is expected that legislation will be passed this year securing to the freehold owners one-half share of the proceeds of leased bewaarplaatsen. Indeed, the Bill was only withdrawn last Parliamentary session because of pressure of time. Under this arrangement, your company will receive 50 per cent. of the annual rental (£4,690) paid for the bewaarplaatsen leased to it by Government, and in addition will, as freehold owner, get half the amount derived from certain bewaarplaatsen to be leased in future to other mines better situated for working the ground. Mr. J. A. Hebbard resigned his position as manager of your mine in May last, and Mr. Hugh Mitchell was appointed in his stead. To Mr. Mitchell and his staff we must record our thanks for good work satisfactorily performed during trying and difficult times.

The report and accounts were seconded by Mr. N. J. Scholtz and adopted unanimously

On the proposal of Mr. W. H. Crawford, seconded by Mr. C. A. Ferguson, the appointment of Mr. James H. Crosby as a director (vice Sir J. W S. Langerman, M.L.A., retired), was confirmed.

On the proposal of Mr. James H. Crosby, seconded by Mr. N. J. Scholtz, the appointment of Mr. W. H. Crawford as a director (vice Mr. F. S Tudhope, retired) was confirmed. There being no other nominations, Mr. W. H. Crawford was re-elected a director of the company.

On the motion of Mr. James H. Crosby, seconded by Mr. C. A. Ferguson, Mr. S. Fleischer and Messrs. C. L. Andersson and Co., were elected auditors for the ensuing year, and the remuneration for the past audit was left in the hands of the directors.

RANDFONTEIN CENTRAL.

Shortage of Native Labour.

Improved Outlook.

The seventh ordinary general meeting of shareholders in the Randfontein Central Gold Mining Company, Limited, was held in the board-room, Mayfair, on March 9th. Mr. James H. Crosby, vice-chairman, presided, and there were present, personally and by proxy, Messrs. N. J. Scholtz, C. A. Ferguson, W. H. Crawford, J. H. Tiley, Sir J. B. Robinson, Bart., the Randfontein Estates G.M. Co., Witwatersrand, Limited, and J. C. K. Pollock, secretary. Shares represented personally and by proxy totalled 3,118,566.

The Chairman's Speech.

The Chairman, in formally moving the adoption of the statement of accounts and reports, said: No change has taken place in your property during the year under review. The four mills on the southern division and the big mill on the northern division ran for 314 days, and 800 stamps crushed 2,533,043 tons, producing 737,275 ounces of fine gold. Revenue amounted to £3,103,166 (24s. 6.02d. per ton milled) and expenditure to £2,182,032 (17s. 2.74d. per ton milled). The resultant profit of £921,134 (7s. 3.28d. per ton milled) is carried to appropriation account, together with the balance brought forward from 1912 (£33,598), and dividend received (£129), forming a total credit of £954,861, which has been dealt with as follows: Dividends, £419,370 (10 per cent.); debenture interest, £180,000; profits tax, £56,372; licences, rates, taxes, audit fees, etc., £22,544; contributions under the Miners' Phthisis Act, £49,944; strike account, £14,377; sundries, £2,231, and the balance of £210,023 has been appropriated towards the year's capital expenditure. As doubtless you are aware, it has been an anxious and trying year, and the above results show that, despite the many difficulties and drawbacks caused by white labour unrest and shortage of natives, we have been able to earn £34,734 more than last year, though 40,865 tons less have been crushed. I would draw your attention to the fact that the shrinkage in our labour force has not caused any modification of the sound policy of keeping development well ahead. In point of fact, considerable increases have been effected in the footage accomplished as compared with 1912. The development work carried on during the year consisted of 2,196 feet of shaft sinking and 89,433 feet of driving, rising and winzing, besides 498,277 cubic feet of ore bins, sumps, stations, etc. The ore reserves at the end of the year (as per surveyor's certificate) amount to 8,635.610 tons of which 6,818,929 tons show average assay values of 6.5 dwts. (27s. 7.3d. per ton) and the balance of 1.816,681 tons are valued at 3.1 dwts. I may say that the general manager reports having milled 63.829 tons during the year worth 5.2 dwts. per ton, which had previously been classed among the unpayable 3 dwt. ore. Machinery and plant throughout the property have been well maintained.

Hand Better Than Machine Drilling.

Operations have been much hampered during the second half of the year by the shortage of native labour. The natives in our employ at the 30th of June and the 31st of December numbered respectively 24,383 and 18,578. In consequence we were only able to mill 1,164,156 tons during the second half, for a profit of £435,270, as against 1,368,887 tons during the first half, for a profit of £485,864. Strenuous efforts were made to deal with the position, and rock drills were used wherever possible. No very good results were achieved, however. and we are still on the look-out for a suitable machine. On this property, with its steep roofs, we find that machine drilling costs more per ton milled and does not give the results obtainable from native hand-drillers. Hence, as compared with the results that could have been got from the same places were hand-drillers available, we have to face not only increased working costs, but a drop in grade. The management is not without hope, however, that a machine will be evolved that will render the company to some extent independent of the fluctuations of the native labour supply. without sacrifice of efficiency.

Native Shrinkage.

The shrinkage in the native complement is general throughout the Rand, and is by no means confined to Randfontein. As a matter of fact, the natives in our employ at the end of the year numbered 76 per cent. of the complement, and the rest of the Witwatersrand had only 66 per cent. of complement employed. We had greater trouble in facing the difficulties caused by the deficiency, though. for the reasons already given as to the comparative failure of rock-drills. The labour shortage is consequent on the farming operations of the natives during the past season being more successful than usual, and when the native sees good crops he is totally disinclined to seek work as he does in normal times. I am glad to say that there are unmistakable signs that our operations will not suffer from the same acute degree of shortage of native labour during the forthcoming year. A dividend of 5 per cent. was declared for the year 1912 and two dividends totalling 10 per cent. for the year 1913, namely, 7½ per cent. at the 30th of June, and 2½ per cent. at the 31st of December. In connection with the obligations of the company to redeem a certain fixed proportion of its outstanding debentures on the 1st of March, 1914, I may say that the required number of debentures has already been purchased, and the transaction will be reflected in the 1914 accounts.

Strikes and After.

You have, of course, followed the events of June and July last, when a trifling dispute at the New Kleinfontein Mine, situated about fifty miles from Randfontein, developed into an organised and general strike throughout the whole of the Witwatersrand. We had emphatic assurances from our employes that they had no grievances at all, but were impelled to cease work out of misguided "sympathy" for the New Kleinfontein strikers. Operations were, perforce, suspended on your property for about a week, but the efforts of the strike persisted in greater or lesser degree down to the events of six months later. Owing to the Government not having had time last July to complete their Defence Force arrangements, they concluded an agreement with the strike leaders which the men interpreted as favourable to their pretensions, with damaging results to industrial discipline for the ensuing six months. The Government, having learned a lesson, was not caught unprepared when the incidents of the early part of 1914 arose, and the air has now been effectually cleared. The Government has demonstrated that it is able and willing to take the necessary steps to prevent unwarranted interference with the gold mining industry. and has shown that it realises the importance to the prosperity of the country of the continuous and uninterrupted working of the mines. One of the terms of settlement of the July strike was that an inquiry be held into questions of wages paid and cost of living. An independent commission was appointed, and its report has just been issued. It is to be hoped that its outcome may be some lightening of the burdens placed on the gold mines, as an instance of which I may here draw your attention to the item in the appropriation account, which shows that our contributions during the last year under the Miners' Phthisis Act amounted to the huge sum of nearly fifty thousand pounds sterling. You may perhaps have seen in the newspapers that the Chamber of Mines gave evidence before this commission on the probable life of the Witwatersrand. Whatever conclusions may be drawn from this evidence, the fact is not affected that your property, with its great extent of reef-bearing ground and the exceedingly steep dip of those reefs, possesses a life perhaps unsurpassed in length by any other mine on those fields, working, too, at the full capacity of its shafts and plant. In conclusion, I must express sincere thanks to the general manager and the whole of your company's staff, who have worked unsparingly during a troublous and difficult year.

The report and accounts were seconded by Mr. N. J. Scholtz and adopted unanimously.

On the proposal of Mr. W. H. Crawford, seconded by Mr. C. A. Ferguson, the appointment of Mr. James H. Crosby as a director (vice Sir J. W. S. Langerman, Kt., M.L.A., retired) was confirmed.

On the proposal of Mr. James H. Crosby, seconded by Mr. N. J. Scholtz, the appointment of Mr. W. H. Crawford as a director (vice Mr. F. S Tudhope, retired) was confirmed.

There being no other nominations, Sir Joseph Benjamin Robinson, Bart., and Mr. W. H Crawford were re-elected directors of the company.

On the motion of Mr. W. H. Crawford, seconded by Mr. C. A. Ferguson, Mr. S. Fleischer and Messrs. C. L. Andersson and Co. were re-elected auditors for the ensuing year, and the remuneration for the past audit was left in the hands of the directors

RANDFONTEIN ESTATES.

Result of Year's Operations.

The twenty-first ordinary general meeting of shareholders in the Randfontein Estates Gold Mining Company (Witwatersrand, Ltd.) was held in the Board Room, Mayfair, on March 9th, Mr. J. H. Crosby, vice-chairman, presided, and there were present Messrs. C. A. Ferguson, N. J. Scholtz, W. H. Crawford, J. H. Tiley, J. A. Baumann, J. B. Chapman, A. M. Hunter, W. R. Keatinge, S. V. Mann, A. J. Mills, Hugh Mitchell. M. L. Pessen, W. Pope, W. J. Reid, A. J. Rannie, T. W. Robson, J. Otrich, W. T. Temby, W. H. Treloar, A. J. Vine, A. C. Webster, F. E. Williams, P. J. A. Winter, J. A. Yule, A. C. H. Luxton, E. Crowther, T. P. E. Butt and F. Mills, representing 566,480 out of an issued capital of 3.001,548.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts said: The capital of your company remains the same as last reported, viz., £3.001,548, and your property, as detailed in the directors' report, is practically unchanged. On reference to the accounts before you, it will be noticed that the profit for he year carried to the appropriation account amounted to £490,939, which, together with the amount brought forward from the previous year—£231,265—makes a total of £722,204, which has been dealt with in the following manner: In payment of debenture interest, £119,794; capital expenditure and rates, taxes, licences and audit fees, etc., £23,291; leaving an amount of £579,119, out of which the directors declared dividends for the year totalling 10 per cent., equalling a cash distribution of £300,154, and carried forward £278,965 to next year's accounts. The available cash at 31st of December was £105.531.

Randfontein Central.

As you all know, this company is dependent for its revenue to a considerable extent on the success of the operations of the Randfontein Central G.M. Co., Ltd. Unfortunately the Central Company, in common with other Witwatersrand mines, suffered greatly during the last six months of the year, due principally to the strike in July and to the shortage of native labour. The operating results of this subsidiary for the year under review are as follows: 800 stamps ran 14 days and crushed 2.533.043 tons, producing 737,275 ounces of fine gold. Revenue amounted to £3,105.166 (24s. 6.02d. per ton milled), expenditure to £2.182.032 (17s. 2.74d. per ton milled), and profit came to £921.134, or 7s. 3.28d. per ton milled. The Central Company declared the same dividends as did your company, viz., 7½ per cent. in July and 2½ per cent. in December. Particular attention was paid to development, notwithstanding the acute shortage of natives, and 2,196 feet of shaft-sinking, 89.433 feet of driving, rising and winzing, and 498.277 cubic feet of ore bins, sumps, stations, etc., were accomplished. The ore reserves at the end of the year amounted to 8.635.610 tons, of which 6,818,929 tons give average assay values of 6.5 dwts., or 27s. 7.3d. per ton. Your revenue shows an increase of £147.594, mainly due to the enhanced dividends received on your holding of Central shares (10 per cent. in 1913, as against 5 per cent. in 1912), and this enabled a distribution of 10 per cent. to be made, or double the rate of last year

Steady Progress.

Steady progress is shown at your power station. 87,771,733 units were sold, as against 81,261,239 for the previous year, and as costs at 0.2339d. per unit show a decrease of 0.012d. per unit, your revenue is correspondingly benefited. We are adding to our plant a new cooling reservoir of 1,500,000 gallons of water per hour capacity, and a 6,000 k.w. turbo alternator, to meet the demands of your subsidiary company, the Randfontein Central.

A certain amount of prospecting has been done on the company's unproclaimed farms, and reefs have been exposed which are now being developed. There has not been sufficient work done up to the present to enable a definite statement to be made as regards their permanence and payability; but I must add that the results thus far obtained are distinctly encouraging, and the directors hope at a later date to make an announcement to shareholders on this subject.

On the 20th December last the following advertisement was published in the newspapers: "The company announce that £54,400 6 per cent. first mortgage debentures have been purchased and cancelled in satisfaction of the redemption due on the 1st of March, 1914, in terms of the debenture trust deed dated 19th February, 1909." You will have gathered from this that rather than wait till the 1st of March, 1914, to redeem the stipulated proportion of the outstanding debentures at par, it was thought advisable to take advantage of favourable market conditions and purchase the required amount, which, I may say, was done at a discount. The transaction will be shown in this year's accounts.

The report and accounts were seconded by Mr. C. A. Ferguson and carried unanimously.

On the proposal of Mr. W. H. Crawford, seconded by Mr. M. L. Pessen, the appointment of Mr. Jas. H. Crosby as a director (vice Sir J. W. S. Langerman, Kt., M.L.A., retired) was confirmed.

On the proposal of Mr. Jas. H Crosby, seconded by Mr. C. A. Ferguson, the appointment of Mr. W. H. Crawford as a director (vice Mr. F. S. Tudhope, retired) was confirmed.

There being no other nominations, Sir Joseph Benjamin Robinson, Bart., was re-elected a director of the company.

On the motion of Mr. N. J. Scholtz, seconded by Mr. W. H. Crawford, Mr. S. Fleischer and Messrs. C. L. Andersson and Co. were elected auditors for the ensuing year, and the remuneration for the past audit was left in the hands of the directors.

Persons infected with miners' phthisis are prohibited from working on Rhodesian mines.

Frank Smith Diamonds.

For the month of February the results were as follows:—57,152 loads washed, yielding 2,160 carats. Recoveries for previous three months: November, 1913, 1,632 carats; December, 1913, 1,815 carats; January, 1914, 2,310 carats.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of February, 1914:—Tons crushed, 3,452, yielding 1,794 fine ozs.; estimated value of output, £7,554; estimated profit for month, £4,359.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—Williamson's Gilbert & Sullivan Opera Co.	8.15
Standard—Louis Meyer's Company	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

TENDERS.

TENDERS will be received by the Undersigned for the Purchase and Removal of the COLLIERY PLANT and EQUIPMENT standing on the Farm SCHAPENRUST No. 13, the property of the EAST RAND CENTRAL MINES, LTD.

The Plant includes:—

HEADGEAR AND SORTING PLATFORM OF STEEL GIRDER WORK

LOCO TYPE BOILER

TUBULAR BOILER.

HORIZONTAL ENGINE.

RAILS, &c., &c.

Full Particulars of the Plant for Sale may be had upon application, and Tenders should be handed in on or before the 21st MARCH 1914.

The highest or any tender will not necessarily be accepted.

By Order of the Board,
C. L. ANDERSSON & CO.,
Secretaries.

East Rand Central Mines, Ltd.,
31-39, Meischke's Building,
Harrison Street
(P.O. Box 2162),
Johannesburg.

Cable: "McKechnie Widnes."

McKechnie Brothers,

Smelting Works,

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NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the First Ordinary General Meeting of Shareholders in the above Company will be held on SATURDAY, the 14th day of MARCH, 1914, at 7.30 p.m., in the Board-room, Grand National Hotel, Rissik Street, Johannesburg, for the following purposes:—

(1) To receive, and if approved, adopt the Directors' Report, Balance Sheet and Auditors' Report, as at the 31st December, 1913.
(2) To elect Directors in the place of those retiring.
(3) To appoint an Auditor in place of Mr. C. E. Nelson, who retires, and offers himself for re-election; and to fix the remuneration for the past Audit.
(4) To consider such other business as may be transacted at an Ordinary General Meeting.

The Transfer Books of the Company will be closed from the 7th day of March to the 16th day of March, 1914, both days inclusive.

Nominations to fill the seats on the Board, must be delivered in writing at the office of the Company at least three clear days before the date of the meeting.

By Order of the Board,
C. W. HERALD, Secretary.

Notice of Extraordinary General Meeting.

NOTICE IS HEREBY GIVEN that an Extraordinary General Meeting of Shareholders in the above Company will be held on conclusion of the Ordinary General Meeting.

Particulars of the business to be transacted have been posted to all registered Shareholders.

By Order of the Board,
C. W. HERALD, Secretary.

71, Standard Theatre Buildings, Johannesburg,
5th March, 1914.

THE SOUTH AFRICAN
Mining Journal,

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CONTENTS.

PAGE
Notes and News 57

Topics of the Week:

The Outlook for the Mines 59
The Campaign Against Mine Accidents 60
A Cape Tin Flotation 61
Mining Activity in the Pietersburg District 61
Madagascar Oil Fields 62
Princess Estate: Position and Prospects 62
Progress of the " Safety First " Movement 63
The Year with the Transvaal Coal Trust 64
The Various Estimates of the Life of the Rand 64
Village Deep Developments 65
Harrisdale Syndicate Secures a Tin Property 65
The Position and Prospects of the Brakpan Mines ... 66
The Year with the Wit. Deep 67
Satisfactory Progress at the Springs Mines 67
Improving Prospects of the Simmer Deep 67
Prospecting for Radium 68
Prospects of the Modderfontein Deep Levels 68
The Position of the Jupiter 69
The Year with the Geduld Proprietary Mines 69

Rhodesian Section:

The Present Status of Rhodesian Mining 70
Latest Mining News 71
The Assay of Tin Ores 72
The Life of the May Consolidated 72
Engineering Notes and News 73
Improved Practice in Water-Fed Hammer Drills ... 73
Mining Men and Matters 75
Finance, Commerce and Industries 76
The Week in the Sharemarket 77
Automobile Notes 78
Company Meetings 79
Books Received 80

Notes and News.

Provincial Council Elections.

Although this is not in any sense a political paper, the victory of the Labour Party at the Provincial Council elections this week cannot be allowed to pass unnoticed. For reasons that are now familiar to everyone, the bulk of the Rand and Pretoria electorate have chosen to vote Labour, and the result is a Labour majority of one in the Provincial Council. It is the first time the Party has been in any position of power or responsibility in this country, and we have no means of knowing how they will now behave. Presumably they are not anxious to bring ruin and financial embarrassment on the Province, and their actions may, therefore, be tempered by a spirit of reason and moderation, which their public utterances unfortunately have lacked. If they really desire to widen the field of employment in the Transvaal they must make it their constant care to increase the attractions for capital, without which the undoubtedly vast natural resources of the Province must languish indefinitely undeveloped. Revolutionary Socialist nostrums and rule-of-thumb recipes for reform, such as the single tax, dear to the heart of their leader, Mr. " Wholly Land " Lucas, must be eschewed, for that way trouble lies. Doubtless nothing in the way of advice tendered by us at this juncture can affect the policy of the new Party in the Provincial Council. We can only " wait and see," hoping that wisdom may prevail.

* * * *

The Twin Shaft Idea.

In our issue of March 7th last we referred to the sinking of twin shafts at the Messina Mine, and we then alluded to the remarks made by Mr. Ruel C. Warriner on this subject. Mr. Warriner dealt with a suggestion made by Mr. Woodburn, manager of the Messina Mine, that in equipping a new property additional efficiency could be obtained in the lay-out by sinking two shafts close together instead of at a distance of a thousand yards or so. Mr. Warriner, in replying to the discussion on his now famous paper, said that from a ventilation and mining point of view he could not see what advantage would be gained by following out Mr. Woodburn's suggestion. We refer to the matter again because it is desirable to point out that Mr. Woodburn's suggestion was made in reference to the exploitation of new ground and not specifically to the Crown Mines as it is at present constituted. We understand Mr. Woodburn to hold the view that if, for instance, the ground below the dyke in the Crown Mines were treated as a separate property the sinking of shafts could best be centralised by sinking two verticals close together. At the Crown Mines work has been concentrated around one or two shafts and a number have been practically abandoned and are only used for purposes of ventilation. The circumstances here are thus different to those which would have to be taken into account in the opening up of virgin ground. In such an undertaking Mr. Woodburn and some other mining engineers think that the sinking of two shafts close together possesses advantages over any other method.

* * * *

Encouragement of Mining.

The following is the official text of Mr. Nathan's questions and the Minister's answer last week in the House of Assembly in regard to encouraging mining:—Mr. E. Nathan (Von Brandis) asked the Minister of Mines and Industries: "(1) Whether the Government intends introducing any legislation which will encourage and induce the introduction of fresh capital into the Union for the development of dormant mining areas, if so, in what direction; (2) whether the Government is prepared to encourage prospectors and small mining men by the reduction or abolition of claim licences where claims are in the early stages of development; and (3) whether the Government will include in such legislation the throwing open of all farms to prospectors, with due safeguards to owners?" The Minister of Mines replied: " (1) While the Government is anxious to encourage the introduction of fresh capital and the development of prospecting and mining operations, there is no intention of introducing any legislation during the present session affecting the Mining Laws. (2) The reduction of claim licences would necessitate amendments to the existing Mining Laws which are not possible at present, especially having regard to the magnitude of the work of consolidating the Mining Laws of the Union. (3) The question of the throwing open of private farms to prospectors was fully investigated by the Select Committee of the Transvaal Parliament when the present Gold Law of 1908 was passed. The Government is not prepared at present to depart from the policy which was laid down."

* * * *

The Sakalava Meeting.

About four hundred shareholders in the Sakalava Oil Company were present at the annual meeting last Saturday night. When questions were reached a local solicitor named Mr. Hutchinson expressed the opinion that they had had nothing but promises for the £5,000 which had been spent. He proposed the addition of two shareholders to the board. A heated discussion, leading to uproar, followed. Ultimately Mr. Hutchinson challenged the legality of the meeting, on the ground that notices of it had been posted only a week before, while the Free State law required a fortnight's notice. The Chairman then announced that as the meeting was supposed to be illegal they could not hold the extraordinary meeting which was to have been held immediately after the general meeting.

* * * *

The Rise in Stocks.

Notwithstanding the set-back in Stock Exchange securities which occurred during the week previous to the 20th February, the date of the *Bankers' Magazine* valuation, the rise during the earlier part of the period was so enormous that on balance the list of 387 representative stocks shows an appreciation for the month of no less than £66,000,000, which is quite the heaviest gain during any one month for a very long time past. Moreover, it must be remembered that it follows a gain for the preceding month of over 48 millions, so that since the beginning of the present year our contemporary's list of stocks may be said to have appreciated by something like £114,000,000, the rally which occurred during the last ten days of 1913 being comparatively small. For the past month the exact movement was as follows:—Aggregate value of 387 representative securities on 20th January, 1914, £3,389,478,000; aggregate value of 387 representative securities on 20th February, 1914, £3,455,452,000; increase, £65,974,000. The *Bankers' Magazine*, in the course of its usual monthly article, says that, apart from a decline in financial, land and investment shares, every department of the Stock Exchange has shared in the general appreciation. Consols at one time during the month rose to 77½, and some idea of the set-back which had occurred at the time of the calculations may be gathered from the fact that Consols on 20th February stood at about 76. In the purely speculative markets South African mining shares—or, to be more precise, Transvaal gold descriptions—after considerable firmness, became quite dull, but the set-back is obscured by the fact that Consolidated Gold Fields and De Beers diamond shares, which are included under "South African Mines," rose substantially.

* * * *

Transvaal Tin Fields, Ltd.

A company called the Transvaal Tin Fields, Ltd., was registered in London on February 23 by Kennedy, Lindo & Co., 13-14 Abchurch Lane, E.C. The capital is £60,000 in 5s. shares. The objects are to take over any concessions, mines, mining leases, mining rights, and metalliferous land in the Transvaal or elsewhere, to carry on the business of tin and general miners, smelters and refiners of and dealers in ores of all kinds, prospectors, explorers, metallurgists, etc., and to adopt an agreement with the Oil Shale Development Company, Limited. The maximum cash subscription is 10 per cent. of the shares offered to the public. The first directors (to be not less than two nor more than seven) are R. W. Mitchell, H. A. Chilton, 31, Brooke Street, Holborn, E.C., and A. V. Davis, 20-23, Finsbury Circus Buildings, E.C. Qualification (except first directors, who require none), £100 (chairman £150) and 5 per cent. of the amount distributed as dividend, free of income tax, divisible. The registered office is 18, Eldon Street, E.C.

* * * *

Sources of the Rhodesian Output.

Although large controlling corporations have during recent years acquired many of the more promising "small mines" of Southern Rhodesia and have thus appreciably thinned the ranks of the mines which are not affiliated with the large companies, the small man element still constitutes a very important factor in Rhodesian mining. This is well brought out in an analysis of the Rhodesian output of last year. In 1913 there were 468 producers of gold, 36 of these being companies, 79 tributors of company's claims, and 353 small syndicates and individual workers and privately-owned claims. The companies working on their own account dealt with 1,103,065 tons for a return of £1,905,806, or 65·6 per cent. of the total. Tributors of companies' claims crushed 322,229 tons for a total yield of £410,592, or 14·1 per cent., making the total output from the companies' claims 79·7 per cent. of the gross yield. Individual workers crushed 328,631 tons for a total recovery of £586,870, or 20·3 per cent. of the gross gold yield. At the end of the year there were 25 company producers, 52 tributors, and 128 small workers, making the total number working at the end of the year 205 as compared with 160 at the end of 1912. The average yield of the companies was 31·55s., of the tributors 25·84s., and of the small workers 35·71s. per ton.

* * * *

The Year with the Brakpan Mines.

Judging from the reports already issued by Rand mining companies for the past year there will be a rather monotonous preface to be inscribed in reviews of the operations of Main Reef subsidiaries during 1913. In each instance it will have to be made clear that the results must be qualified by reference to the July labour troubles and to the resultant dislocation of the native complements of the mines. The Brakpan Company is no exception to this general statement, and the results secured clearly indicate the extreme difficulties of last year's work. In 1913 the ore milled totalled 613,269 tons, which is less by 24,254 tons that that milled during 1912. Whilst the ore milled shows a substantial diminution the profit shows a much more serious falling off—from £444,000 to £291,000. In addition to the labour troubles the Brakpan Company suffered a further check through unfavourable development results. In 1912 sixty-three per cent. of the footage driven, risen and sunk was payable, but last year the percentage declined to 44 per cent.; in other words, more than half the ore blocked out was unpayable and assisted in further increasing the large supplies of unpayable ore accumulated in the mine. At the end of last year the tonnage of ore of this nature was in excess of that segregated as ore which will yield profit, the figures being: unpayable, 2,402,000 tons; payable, 2,242,000 tons. This unpayable ore, which represents 38 per cent. of the total ore developed in the mine to date, has an estimated value of 2·4 dwts. per ton, so that whilst it is reasonable to assume that some proportion of this ore will be worked at a profit in the years to come the bulk of it cannot be expected to yield any profit until working costs have been reduced to 8s. per ton—an achievement which is, we fear, very much in the dim and nebulous future. With regard to costs, the consulting engineer is careful to point out that there were indications at the beginning of 1913 that these would show improvement, but unfortunate circumstances upset all calculations in this direction. Apart from additional expense from labour disorganisation extra cost was involved in connection with caved stopes, so that on the whole the year 1913 must be written down as a singularly unfortunate period for this company. The mine is, of course, still in a strong development position and is likely to earn substantial profits for many years to come, but after the brilliant promise of the first 18 months or so of crushing we are forced to regard Brakpan in the light of the latest developments as one of the disappointing ventures of the Witwatersrand.

Bravery Rewarded.

"An act of this kind, when people go to meet they know not what—perhaps their doom—in saving life, is braver than any act that can possibly take place in war," said the Hon. Johann Rissik, Administrator of the Transvaal, in presenting the silver medal of the Order of St. John of Jerusalem to Messrs. David Mitchell and Simon Terwee before a large gathering recently. The award was made for conspicuous gallantry in a gassing accident at the Main Reef West Mine in January of last year. A white man named Smith and 14 natives were overcome by the fumes resulting from the ignition of a box of explosives, and Messrs. Mitchell and Terwee, who are a shiftboss and a stoper respectively, went in at great personal risk and brought all the men out. Smith and three of the natives died, but all the others recovered. Few braver actions have been recorded in the history of the Rand, and both recipients are to be congratulated on the high and well-deserved honour paid them.

* * * *

The Life of De Beers.

Whilst estimates as to the duration of the future life of the Rand have been falling thick and fast about the ears of the investor of late, it has been noticeable that the craze for venturing prophecies has not extended to diamond mines, tin mines, and copper mines. Such ventures are, geologically, quite different to a sedimentary deposit like the auriferous conglomerates of the Witwatersrand. Hitherto the De Beers Company has held to a sphinx-like silence regarding its life and since diamond pipes are of very deep-seated origin this silence have never been difficult to understand. We are, therefore, exceedingly interested in the statement of Mr. I. Grimmer, delivered before the Dominions Commission at Kimberley, on Thursday.

> Mr. Grimmer, in the course of his evidence, remarked that it had always been the policy of De Beers to restrict production to the amount which the market could absorb, but they did not find all other diamond companies ready to act upon this policy. He agreed that all concerned in De Beers Mines were most sanguine as to their long life. There was no doubt as to the length of life. He could emphatically say fifty years, and probably a great deal longer, at the present rate of production; and, if the wealth of the world increased, so would the demand for diamonds. Answering another question, Mr. Grimmer denied that the company were throttling the output by only restricting it. They could easily double the production if the market warranted it. The mines gave no indication of bottom, and working at greater depths could only be affected by questions of heat and working cost.

A diamond mine with all the vagaries of the market to affect its prosperity is assuredly a most difficult proposition to affix a life estimate to, and we take it that Mr. Grimmer's 50 years means a period of indefinite duration, provided the market and general economic conditions remain at least as favourable as at present. But is that Mr. Grimmer's own personal opinion or the exeogitated calculation of the Board of De Beers and the technical experts of the company?

* * * *

The Coal Fields of Rhodesia.

We have received a copy of the Geological Survey of Southern Rhodesia Bulletin No. 4, and we would here like to congratulate the director and his assistants on the value and interest of their work as disclosed in this book. A word of praise is also undoubtedly due to the Argus Company for the excellent manner in which photographs and diagrams have been reproduced, whilst the general "get up" of the work is admirable. The Bulletin deals exclusively with the Rhodesian coal fields, and three most valuable contributions are contained therein. Mr. Maufe, the Director of the Survey, writes of "The Coal Resources of Rhodesia"; Mr. A. R. Thompson, General Manager of the Wankie Colliery, discusses "The Wankie Colliery and the Method of Working the Coal"; and Mr. B. Lightfoot treats of "The Geology of the North-Western Part of the Wankie Coal Field." We shall have a good deal more to say regarding this highly interesting brochure in our next issue.

TOPICS OF THE WEEK.

THE OUTLOOK FOR THE MINES.

"*The prospects . . . are involved in settled conditions of labour, increase in the native supply, curtailment of the burdens placed upon the mining industry (particularly as affecting low grade mines), advance in mining methods, and improved practice with water-fed hammer drills.*"—Mr. C. D. Leslie, Superintending Engineer, Consolidated Gold Fields of South Africa.

Seldom have the five chief factors conditioning the future of the Rand mining industry been summarized in more succinct or pregnant terms than the foregoing. Mr. Leslie, it is true, uses them to limit and define the prospects of the now silent Jupiter, but they are obviously capable of extended and general application to the whole industry today. Indeed, they might fairly be regarded as Mr. Leslie's contribution to the recent discussion in these pages on the present evils that beset the industry. Here, in a nutshell, is gathered together what the Rand must do to be saved; and no one who has given any thought to the matter at all can doubt that wide range of endeavour faintly indicated by these brief captions is now the subject of deep and earnest study on the part of the brain-carriers of the industry. Thus, read in the light of recent practice and experience on the mines, the remarks quoted, which might otherwise be dismissed as trite and commonplace, become the brief and abstract chronicle of the settled progressive programme of the mines to-day. To take, first, settled conditions of labour, a moment's thought will show how wide and fruitful is the field for effort and reform indicated. The contentment that is to be sought for is conditioned by no question of colour, for of the black it is no less true than of the white that the satisfied worker is worth, if Sir John Livesey's estimate be correct, 15 per cent. as much again as the dissatisfied. How the native worker on the mines is to be made content was illustrated in our last issue by copious suggestions and extracts from the report of the Economic Commission, and we shall be surprised if an early effort to "implement" the recommendations of that Commission is not put forth. As summarized by us, those recommendations were:—(1) The introduction of a system of piece rates for the payment of native workers; (2) the elimination of the colour bar in mine work; (3) the transference of the organization of native labour underground from the contractor, who is without any special organizing ability, to a white overseer employed by the mine, who has that ability; and (4) the adoption of a system of providing locations on or near the Rand, to which natives can bring their families. Something more, however, than contentment of native labour is obviously connoted by the phrase "settled conditions of labour." In the light of the white labour upheaval on the Rand that marked and marred the past year it is plain that those responsible for the management and administration of the industry are fully awake to the folly and expense of continued white labour unrest, and that they are genuinely and sincerely anxious—if only for the best of all reasons, self-interest—to remove every grievance, and even the very appearance of a grievance, under which the white employee on the mines may be said to labour. To our mind the thought and effort expended in this regard will have a direct financial return, and by a simple arithmetical calculation it can be shown that mere multiplication of white employees on the mines is less economical than the diminution in the causes of present discontent, assuming. that is, the reality of the discontent. The second factor in Mr. Leslie's list—increase in the native labour supply upon which the prospects of the Rand are, in our implication, based, is closely bound up with the first, and may be more briefly dismissed. It is a truism that expansion of the industry is governed by this factor, and there are critics who delight in spoiling the optimists' dreams of a greater Rand by dryly pointing out that even if everything else were favourable to the opening of our dormant mines and mineralized areas, there is not enough native labour to work them. Here again, despite criticisms, we have the satisfaction of knowing that the best brains of the industry are co-operating—the perennial rumours to the contrary notwithstanding—to expedite recruiting and to increase the supply. It is not too much to say that no more notable or effective step in that direction has yet been taken than the serious consideration lately accorded to the question of increasing the rewards and opportunity of the natives on the mines. Of the third factor of progress—"the curtailment of the burdens placed upon the industry"—it may be said that the subject is by now worn threadbare. Taxation, direct and indirect, in all its forms, and the burden of red-tape regulations are plainly indicated, and as all our adjectives have long since been exhausted in their condemnation, we pass on to the fourth of Mr. Leslie's suggestions. "Advance in mining methods" tersely describes the whole field of potential improvement that lies underground; a field notoriously fallow, and the last to come under the plough and harrow of the analytical specialist in cost reduction. The extent of the area outlined under this head is too great to be compressed into the compass of this cursory review. It demands a separate article to itself, sub-divided into chapters on centralization, mechanical improvements, labour re-organization, and generally—again to borrow a metaphor from agriculture—to deal with the intenser cultivation of the underground portion of the industrial field. Indeed, the future of Rand working costs lies underground, and there is reason to believe that substantial economies are certain to accrue from the attention now being concentrated thereupon. Mr. Leslie's last and most definite hope is based upon the improvement of that first essential of modern mining—the rock drill. His own phrase is "improved practice with water-fed hammer drills," and he has plainly in view the results already achieved by and still expected from the drills answering this description now in daily increasing use on the Rand. One of these drills, the "Leyner-Ingersoll," is fully described in another part of this issue, and of its most formidable competitor, the "Atlas," a detailed account will shortly be available. Definite official statements regarding the success of these drills will doubtless be made at an early date, and it is enough here to indicate how near the realm of the actual is Mr. Leslie's last factor of Rand hope and progress. All five, it will be seen, are contributory to the great industrial preoccupation of the moment—the reduction of mine working costs, which now as ever rules the fate and future of the industry. This is the problem which, back of all others—as our American friends say—engages quietly, unostentatiously and continuously the best brains of the industry to-day. Though they neither expect nor seek public gratitude or political preferment for what they take to be their plain duty to those for whom they stand trustees, still these mere engineers and directors are building better than they know, since a prosperous industry means a prosperous South Africa.

THE CAMPAIGN AGAINST MINE ACCIDENTS.

Marked success continues to attend the progress of the "Safety First" movement on the Rand, and evidences of its many-sided activity multiply daily. In this issue details are given of the first fruits of the movement, in the form of descriptions of four safety devices of an eminently practical nature. These have been examined and approved of by the Mine Managers' Association, and by that body passed on to its members on the Reef. The "Safety First" Committee of the Rand Mutual Assurance Society, to whom the credit for the initiation of the movement is due, are leaving nothing undone to make progress worthy of their excellent beginning. The lay, as well as the technical, Press is freely employed to give publicity to their efforts; and the policy is being rewarded by the increasing popularity of the movement on the mines. The most ambitious step yet taken by the Committee is the decision to participate officially in the forthcoming Mining Exhibition at the Drill Hall in May. As already announced, that Exhibition will be held under the auspices of the Chemical, Metallurgical and Mining Society of South Africa, and the success of the exhibitions held by this body in previous years is ample guarantee that the approaching display will exceed all anticipations. Prizes will be offered by the Committee, of £25, £15 and £10 each for the best device or idea bearing on safety measures, and, at the suggestion of the Government Mining Engineer, it was decided to include ideas for safety procedure in the same category. A special prize is offered for a safety lamp for use when handling explosives, and though this may appeal primarily to manufactures, a worker's success is not precluded. It will be seen that ample time is given to prepare for the competition, as the Exhibition does not take place till near the end of May next. A big and hearty response to the enterprise of the Committee is earnestly to be desired. In other directions the Rand "Safety First" Committee is going about its work in a highly systematic way. Naturally, the co-operation of the Mines Department—whose inspectors have of late years been making a special study of mine accidents—is enlisted and progress of the "Safety First" movement in other countries is carefully noted. In the United States, for instance, the movement, though not many years old, has already made remarkable progress. A Museum of Safety has been established in New York and a Congress of Safety has gone deeply into this vital problem of applied conservation. Statistics of the metal mine accidents in the United States during the year 1912, recently published by the Bureau of Mines, are indicative of the success of the "Safety First" campaign. During 1912 the number of men killed in and about metal mines in the United States was 661, compared with 695 killed in 1911, so we may consider that 34 human lives were saved. This saving of life is well worth while, but the number of fatalities and accidents is still appallingly large. Mine operators, however, have awakened to the necessity for keeping their workings in better condition and providing more adequate safety appliances, so it is hoped that there will be a gradually diminishing death list in the future. In many States the enactment of rather drastic workmen's compensation laws has forced operators to adopt elaborate precautionary measures, but a large number of mine managers have voluntarily provided better facilities for guarding the lives of their employees since they have found this to be wise from a purely economic standpoint. Mr. H. C. Hoover states that in Australia large sums of money have been spent to make the mines absolutely safe, and that these expenditures have invariably proved to be good business investments, resulting in increased efficiency and lower costs per ton of ore mined. The same result has followed from expenditures by the United States Steel Corporation and other American concerns. Though on the Rand the movement may be regarded as still in its infancy, the promoters are to be congratulated on the results already achieved. Owing to the efforts already put forth by the Mines Department the field for reducing accidents has been more limited than that, say, of the United States, when the "Safety First" campaign began there. Indeed, it may be said that the Rand movement began where that of the United States left off. The effort, however, is daily producing fruit, and with the expected fillip from the forthcoming Exhibition and prize distribution a further big advance may be counted upon for the movement during this, the initial year of its existence.

Transvaal Lands, Ltd.

At the annual meeting of Transvaal Lands, Ltd., recently, in London, a satisfactory position was disclosed. Investments, sundry debtors, and cash at bankers, amount together to £33,101 12s. 9d. The market value of shares in land and mining companies, say £1,000, makes a total of £34,000 odd. Uncalled capital accounts for a further £21,842, and there is the freehold and mineral rights over 390,018 acres of land in the Transvaal, which if only taken at, say, 2s. 6d. per acre, this being a minimum valuation, would produce about £50,000. Beyond this there is interest in the "mineral rights" over a further 83,000 acres of land. Mr. J. H. Rainier is the local representative of the company.

A CAPE TIN FLOTATION.

Details of a Resuscitated Tin Venture to Exploit Lode and Alluvial Formation.

The Good Hope Tin Mines, Ltd., is the name of a venture being floated at Capetown with a capital of £40,000. The company is being formed with the object of acquiring the rights granted under a new agreement dated 19th November, 1913, over a large area of the farm "Hazendal" situated in the district of Stellenbosch, Cape Province. The right is granted to mine for and win tin and other minerals during a period of three years, with the further right to purchase the mineral rights over a selected area of not less than 100 morgen at the price of £50 per morgen (one morgen equals about 2 1-9 English acres). Fifty morgen of surface ground is included for works, etc. Further to acquire the whole of the mine equipment, which includes the headgear, steam winding engine and boiler, water tanks, shafting timber, shed, tin ore in the mine dump, piping, etc. The directors propose to equip the mine, with the addition of a suitable reduction and concentration plant, open up, mine, and win the tin ore for the benefit of the company. The prospectus states:—

> The close proximity of the property to the Railway and to the port of shipment, combined with the advantageous shipping arrangements for exporting the Tin concentrates to England or elsewhere, will reduce expenses to a minimum, and place the Company in a position to secure good net prices for the Tin Concentrates sold. The discovery of Tin on this property is of the greatest importance, and its successful development should not only be advantageous to Shareholders, but also, in a general way, to the District, and the various assays hereafter mentioned disclose a richness in Tin values endorsing the views expressed by several eminent mining engineers. The property is situated about two miles from Kuils River Railway Station, which is about eighteen miles from the Capetown Docks, and the main road to Stellenbosch passes through the farm, which can be reached by motor in about 40 minutes from Capetown. The famous alluvial tin deposit on the farm Annex Langverwacht, which is now being worked by a large London Company, adjoins the property, and it is thought that the alluvial was shed originally from the lode the extension of which has been found and considerably developed on "Hazendal." This company has been shipping about 9 tons of tin on an average per month for the eight months ending December, 1913. This quantity is likely to be considerably increased as the working face gets opened up. A sketch plan of the property and district is hereto attached. The development work carried out on the property has resulted in the discovery of several tin lodes; one of which, No. 5, has been opened up by sinking and driving on the apex of the lode at a depth of 100 feet from the surface, for a distance of about 200 feet, a winze has been sunk on the lode, the bottom of which is 150 feet from the surface. Altogether over 500 feet of shaft sinking and driving has been accomplished with results which must be considered highly satisfactory. A shipment of rock from the No. 5 lode was made which realised payment on an assay of over 20 per cent. metallic tin. The No. 5 lode is being opened up on the hill which has an elevation of about 500ft. above the lower levels of the farm, and at 150ft. from the surface measures over 5ft. wide. In order to work this lode more economically, a vertical shaft has been started, and is now at a depth of 100 feet, and timbered with Jarrah Wood. This shaft has three compartments, one ladder way and a double cage way, and should intersect the lode at a depth of about 350 feet. It has been equipped with a strong headgear, with grooved pulleys and with steam winding engine and boiler, etc., all of which are erected and in good working order. A sum of close upon £3,000 has been spent on development work and equipment, and in addition to the lodes opened up, it is estimated that development rock to the value of about £1,000 is in the dump on the surface. No. 6 lode has been opened up a point distant from the No. 5 shaft of about two miles. A shaft has been put down to a depth of about 30 feet, which has exposed a large body of mineralised lode, which is over 5 ft. wide. The walls of this lode have not yet been exposed. Development assays from this lode show values varying from 1.3 per cent. to 2.476 per cent. tin. The length of the property on the line of strike of the No. 5 lode is about two miles. A deposit of alluvial tin has been opened up, and an experimental washing has been made from which over 29,000 lbs. of tin concentrates has been recovered and shipped to England. This was paid for at the rate of £175 per ton of metallic tin. These concentrates assayed 76.10 per cent. metallic tin, which is nearly pure oxide and were reported as being of very high quality.

Messrs. G. H. Blinkinsop and H. D. Griffiths have reported favourably.

MINING ACTIVITY IN THE PIETERSBURG DISTRICT.

[From A Correspondent.]

Comparatively little is known outside the district—in fact, outside those actually engaged in gold mining—of the possibilities of what I may term the gold-bearing areas of the Pietersburg mining district. A registered output of 175 ounces of reef gold for the January month does not convey much to the general public as to the real worth of its potentialities, and when one asserts that the ground has only been "scratched," the term may be accepted in its double significance, and few will deny the assertion. That gold exists in more than payable quantities no one can deny. In this connection I am able to give some facts which may prove a surprise to many in the mining world, and at the same time give some indication of what may be expected in the near future. The activity at present is centred at a point about three miles from the Marabastad railway station, and seven miles from Pietersburg, and, incidentally, in the midst of a labour district. Above all, the climate is good, and, unlike the low country, perfectly healthy. On the farm Roodepoort the reef has been traced for one and a quarter miles, while it has altogether been proved for about three miles, showing an average width of four feet six inches. From surface indications the reef can be traced for miles beyond these points. The formation is apparently lenticular, with a well-defined footwall and hanging. The quartz is pyritic striped, carrying very fine gold with iron and sulphur in quantities, the gold assaying 15 to 22 dwts. to the ton. The reef, so far as it has been proved, runs due east and west, with a dip south at an angle of eighty degrees. At a distance of about one hundred feet, and running parallel with the reef, is a rich leader, varying in thickness from 4 inches to 12 inches, and in places assaying ounces. At this particular portion, known as "Knights Pietersburg," there is a five stamp mill, and the results of the working are highly satisfactory. The centre of attraction is the "Frieda" mine, now being worked by Mr. J. Eklund privately. Here a five stamp mill is working with concentrating table, while the sands and slimes are subjected to the cyanide process. It is only a matter of two years ago since Mr. Eklund took over the property, and his single-handed work has been rewarded by excellent returns, the estimated extraction being 15 dwts. In fact it may truly be said that to this gentleman is due the credit of bringing to the notice of the public the excellent opportunites offered. The Freda mine is at present working down at a depth of 112 feet, and sinking will be continued during the present month. Adjoining the Freda mine, another syndicate is about to commence work on the line of reef, and there two five-stamp mills are already erected. At a little further distance a Capetown syndicate has taken up claims and commenced development. There is still a large area undeveloped, and only waiting for the men with a limited amount of capital and willing to put their work into it, to do as well as those who have pioneered the field. Altogether the prospects are distinctly encouraging, and during the next few months some interesting discoveries may be confidently anticipated, which may be expected to give a decided impetus to the district.

MADAGASCAR OIL FIELDS.

A Brief Review of the Geological Conditions—The Island's Bad Reputation.

ALTHOUGH the methods pursued by promoters and directors of some of the Madagascar oil concerns are scarcely calculated to inspire the public with confidence, sufficient exploratory work has now apparently been done on the island to establish the fact that Madagascar contains oil indications of an encouraging nature. The name of Madagascar still conveys to most South African speculators an unfavourable impression. The Le Comte fiasco will be fresh in the minds of many of our readers, and although the Le Comte property was a gold venture—or at any rate was supposed to be a gold venture—whilst the propositions now under consideration have been formed to exploit certain areas for oil, it is probable that a great deal of work and much excellent result will have to be achieved before Madagascar regains a decent reputation in the eyes of the mining world.

The disorderly proceedings at the Sakalava Company's meeting on Saturday night are further calculated to prejudice the public against Madagascar concerns, and if any real measure of sustained confidence in the mineral prospects of the island is desired, those associated with the various syndicates and companies operating there will have to see that their methods of conducting business are beyond reproach. But despite the evil reputation of Madagascar as a mining field, it cannot be denied that the prospects of locating payable oil fields in Madagascar are promising.

GEOLOGY OF THE OIL AREA.

To refer first to the geological conditions, it may be remarked that the petroliferous field now being exploited is of reputed Triassic age, and lies between the Bemahara and Bongo-Lava Ranges. The Bongo-Lava range rises to a height of about 3,300 feet above the level of the sea. Westwards, along the foot of the range, runs the sandy, marshy plain of Betsiriry, hemmed in again upon its western edge by the somewhat lower range of the Bemahara. The geological structure of this country is quite simple. In contact with the archaean rocks of the Bongo-Lava, upon whose flanks they rest unconformably, lie the Triassic sandstones, in which the petroleum seepages and bituminous occurrances are found, along a line which runs for many miles in a northerly and southerly direction. Above them come the calcareous rocks of the Jurassic system, followed by Cretaceous and Tertiary rocks allied to those which cover such large areas on the eastern side of the South African continent. The latter circumstance has led to the belief that, although a deep sea channel now exists between Madagascar and the mainland to the west, in earlier geological times there was in all probability a connecting area over which strata similar to those to the western Madagascar coastal area were simultaneously deposited. According to Mons. Levat, petroliferous indications, of greater or less importance, are found for many miles along the narrow belt of Triassic rocks which runs in a continuous line for hundreds of miles along the western side of the island of Madagascar. From Malaimbandy to Mevatanana, for instance, a distance of, say, 300 miles, Triassic rocks with oily characteristics may be traced almost uninterruptedly. Mons. Levat has made it clear in his report that a considerable amount of fruitless expenditure has been incurred owing to operations having been carried on at points where the structure was obviously unpromising. Anticlinals of a marked kind, extending over fairly wide areas have been already located at one place or another, and doubtless more will be mapped from time to time. It is upon these that attention should be concentrated, and, as far as we are aware, this is a policy that is being followed as much as possible by those companies that are now engaged upon exploratory work upon the petroliferous belt.

PRINCESS ESTATE: POSITION AND PROSPECTS.

Reduced Grade and Costs—Ore Reserves Maintained—Native Labour Improving.

In his annual report for 1913, Mr. W. McC. Cameron writes, *inter alia*:—The tonnage milled has been increased by 10,000 tons over 1912, and the waste discarded from the mined ore, although there was a great shortage of native labour during the last six months, was kept at the high figure of 28.5 per cent. The working costs and yield were 21s. 1.2d. and 27s. 5.6d. per ton milled respectively, against the estimates in my last year's report of 21s. costs and 27s. 6d. yield, and costs of 22s. 9.4d. and a yield of 27s. 11.4d. per ton in 1912. As compared with the previous year, the yield is down 5.8d. per ton, and the costs decreased by 1s. 8.2d. per ton milled. A further small reduction in working costs, say, 6d. per ton milled, may be looked for during the coming year, while the yield will remain about the same. The result of the year's work has been a working profit of £21,617, inclusive of sundry revenue, as compared with £6,651 in 1912. Heavy expenditure, charged to working costs, was incurred during the year in connection with water supply to underground faces and apparatus for the prevention of dust, the improvement of ventilation and for repairs to No. 1 (Central Deep) Shaft. The reduction plant has continued to give very excellent results, the actual yield obtained of 97 per cent. and residues assaying but 8d. per ton, being as good, if not better, than obtained anywhere else on these fields. By small alterations and increased efficiency in the running of the plant, its capacity has been further increased to 23,000 tons per month. Capital expenditure was much reduced and was principally incurred in connection with a new hauling engine of increased capacity for No. 1 (Central Section) Shaft and preparations for and sinking No. 2 (West Roodepoort Deep) Shaft, which is essential to the future life of your mine. Sinking actually began in June, but work had to be discontinued again for reasons explained below. The white underground and surface workmen, with the exception of the staff and [illegible] employees, as on all other Rand mines, went on strike on July 4th in sympathy with the striking employees of the New Kleinfontein Gold Company. Protection was inadequate and the strike, a short-lived one, resulted in a victory for the labour unions. Your mine was shut down for four days, and the immediate difference in the cash position on account of the strike is about £3,000, but a more serious position was created as regards native labour by the action of the Government in stopping recruiting for several weeks following on the strike, and by natives leaving for their homes, through fear and other causes, in large numbers. The shortage of native labour thus created made it necessary to close down No. 2 (West Roodepoort Deep) Shaft again and curtail development to the minimum necessary to provide stope faces, while machines were utilised for the breaking of ore in stopes to the utmost extent, and the wider Main Reef and the outcrop section were called upon to produce a greater portion of ore for milling than would have been normally justified. The native labour supply fluctuated from high water mark in February, when 2,979 natives were employed by the company, to 2,062 in August, and you now have 2,507 natives in your compound. Native labour conditions on your mine have at date of writing improved to such an extent that it has been possible to again put the No. 2 (West Roodepoort Deep) Shaft into commission, and sinking is under way. Very little work was, for the reasons quoted, done in the West Roodepoort section, except on the 7th level west, in which level 185 feet sampled in that section averaged 6.7 dwts. over 26 inches milling width. It is of the utmost importance, if the company's finances will permit, to push on the work in this section, as it is also to open the 13th level in the Central Deep section, work on which was likewise stopped on account of the labour position. This 13th level is also at date being again started. A winze was sunk from the 12th level to the horizon on the 13th level and driving started, and there is every indication that ore of good grade can be opened by this level. The ore reserves were remeasured at the end of the year, with the following results:—South Reef, 482,000 tons, assaying 7.5 dwts. over a milling width of 25.6 inches; Main Reef, 152,000 tons, assaying 5.9 dwts. over a milling width of 51.3 inches—total, 634,000 tons, assaying 7.2 dwts. over a milling width of 28.6 inches. Included in the above are 101,000 tons of South Reef, assaying 7.2 dwts. over 25.3 inches, which require further raising and winzing to make them available for mining, as against 110,000 tons of such ore last year. In addition to the above tonnage, there are developed on South Reef 41,000 tons, assaying 9.6 dwts. over a milling width of 26 inches, which must be left to protect the shafts, and low grade ore as follows:—South Reef, 147,000 tons, assaying 4.7 dwts. over a milling width of 25 inches; Main Reef, 168,000 tons, assaying 2.7 dwts. over a milling width of 51.6 inches—total, 315,000 tons, assaying 3.7 dwts. over a milling width of 31.3 inches. While the ore reserves have been fairly maintained, the tonnage being down but 23,000 tons, the grade being practically the same as the previous year, the position will be altered seriously during 1914, unless work is vigorously prosecuted in the areas especially referred to above. The 634,000 tons of profitable ore, quoted above, stands in the company's books at £61,025, or 1s. 11.[illegible]d. per ton, while 2s. 9d. per ton milled was written off for development redemption during the past year. The charge to costs for development redemption was reduced from 3s. to 2s. 6d. per ton milled from July 1st last. This decrease was due to a change in the method of accountancy on which you decided.

PROGRESS OF THE "SAFETY FIRST" MOVEMENT.

First Fruits of the Work of the Prevention of Accidents Committee of the Rand Mutual Assurance Co., Ltd.

A PROMISING start and excellent progress have been made with the "Safety First" movement on the Rand. Particulars of the following safety devices, already recommended by the Mine Managers, through the Mine Managers' Association, have been supplied by courtesy of the Prevention of Accidents Committee of the Rand Mutual Assurance Company, Ltd.:—(1) Dick's device for mill stamps. (2) Overwinding devices: (a) Phillip's, as illustrated and described in the Government Mining Engineer's report for 1912, pages 123/4; (b) Lindberg's—description given below. (3) Handles on trucks for tramming: These handles have been in use for many years by Mr. R. Raine, both on the New Heriot and the Village Main Reef, who states:—"The handles are undoubtedly a decided advantage in saving accidents to boys' fingers, when pushing the trucks along the drives and more especially when trucks are overloaded." The cost of labour and material is given on the drawing as being 2s. 8d. per truck. With regard to the overwinding devices, Messrs. Bartle & Co., Box 1355, Johannesburg, are the sole selling and manufacturing agents for both. The cost of Lindberg's devices is £65 net for double compartment shafts, fitted with runners, or rails, or on the incline. For single compartment shaft, £40 net. These prices do not include cost of erection but include all royalties. Messrs. Bartle & Co. write that they do not think it advisable that the mines themselves should manufacture the device, as the making of the various parts and sections will be under the patentee's supervision, in order that the workmanship and material may be commendable to the idea. The cost of Phillip's device is £23 10s. complete per engine, delivered from stock or 14 days from date of order. This price excludes cost of installation, but includes royalties.

Dick's Device for Hanging up Mill Stamps.

This is a device which has been prepared by a practical mill man, who has had many years' experience on these fields and who received a severe injury to his hand some time ago as the result of a stamp falling accidentally on it. The locking bar has not necessarily to be fitted to each set of five stamps, as it is interchangeable and can be moved to whichever battery it is desired to hang up, provided that the necessary rest sockets are attached to each King post. The bar can be made of any cheap material such as old boiler tubing, provided it is sufficiently strong. As this device has been got out in response to an appeal to employees by the manager of the Geldenhuis Deep, Ltd., at the instance of the Prevention of Accidents Committee of the Rand Mutual Assurance Co., Ltd., it is put before the Mine Manager's Association on the understanding that for each of such mines as the suggestions given in the drawing are acted upon, a bonus of £5 shall be paid to Mr. Dick by the company using the device; such payments may be made either through the Association of Mine Managers or the Rand Mutual Assurance Co., Ltd. It is considered only fair that such ideas as this, unreservedly given out to the industry, without being patented, in response to appeals for suggestions on safety devices, should be encouraged. If they are worth putting into practice the small bonus to the originator referred to above will be an inducement to others to bring forward their ideas.

Lindberg Overwinding Device.

Mr. J. H. Rider thus reports on the Lindberg overwinding device:—The Lindberg overwinding device is not the same as the Philip's safety device, and neither does exactly what the other does. The Philip's device is not a "preventative," but it gives a loud warning to the driver in either of the following conditions, namely:—(a) When the hoist is standing with the skip at the surface or in the tip if the driver merely moves his lever in the wrong direction, *i.e.*, to wind it when he should lower; (b) if the driver brings his skip up past a predetermined point below the collar of the shaft, without shutting power off. The Lindberg device is an overwinding preventer, as it automatically shuts the power off and applies the brakes if the skip is brought up to a predetermined point, either above the collar of the shaft when hoisting men or above the tipping point when hoisting rock. To make the Lindberg device work for either men or rock, a hand controller has to be moved by the driver to "men" or "rock" according to the signals given from below. The Lindberg device will not give any warning to the driver if he should put his lever in the wrong direction until the skip has actually moved, and then power is cut off and the brakes applied. The Philip's device gives an actual warning to the driver and gives him a chance to correct his error before the skip moves. If the driver is bringing his skip up the shaft and has not cut the power off at the right point, the Philip's device gives him warning before the skip reaches the collar of the shaft, but with the Lindberg device the skip would come right on and go right up into the tip (if hoisting rock) before the overwinding device would work, and then the brakes would go suddenly on. I think each device has its own proper field, and what we want is a judicious combination of the two. The Philip's arrangements can easily be combined with that of Lindberg. (1) I think the Lindberg device is an exceedingly good one. (2) At present it is only installed at the Ferreira Deep. (3) At the cost somewhere between £50 and £70 per winding engine to instal. (4) I do not know of anything better to carry out the particular work which it does, but as I stated above, I think it should be combined with the Philip's to make an entirely satisfactory article.

The Philip's Safety Device.

In this arrangement a small control switch, of the rotating drum pattern, is installed on or under the driver's platform and worked direct from his control lever. Mounted upon the indicator spindle at the back of the dial, is an insulated disc carrying a contact piece, which engages with two spring contact fingers fixed in any predetermined position to give a warning signal whence required. The signal usually used is an electric hooter, in order to be clearly distinguishable from the ordinary bell signals. This method of signalling can be worked from any low voltage system available, such as signal batteries or lighting circuit. The operation is as follows:—When, in what may be called the danger zone (which may be taken as a point a few feet below the collar of the shaft up to the tip), the brass contact on the insulated disc on the depth indicator is making contact with the two brass springs above mentioned immediately the driver's lever is moved from the neutral position, to such a position as would move the skip or cage upwards, the circuit is completed and the warning signal given.

Transvaal G.M. Estates.

An interim dividend of 17½ per cent. (3s. 6d. per share) has been declared by the Transvaal Gold Mining Estates for the half-year ending 31st March, 1914, payable to all shareholders registered in the books of the company at the close of business on Tuesday, the 31st day of March, 1914.

Worcester Annual Meeting.

At the annual meeting of the Worcester Gold Mining Co., last week, Mr. F. Lindenberg, the Chairman, explained that the decreased output on the year was due to the serious shortage of labour as the Swazis would not turn out so long as there was an abundance of maize. He had seen anonymous letters in the Press, complaining at the postponement of the dividend till March, because it was paid out in February last year, but that was declared a month too soon owing to the necessity for keeping a month's reserve always in hand for wages and contingencies. Some Capetown shareholders commented favourably on the report. The auditors and directors were re-elected.

THE VARIOUS ESTIMATES OF THE LIFE OF THE RAND.

A Study in Inconsistencies—Forecasts.

The evidence submitted to the Economic Commission by the Chamber of Mines, and particularly that portion which deals with the prophecy that the present rate of crushing—twenty-eight million tons per annum—will be maintained for five years more, and that thereafter there will be a decrease to one-half the present tonnage by the year 1931, has been seized upon with avidity by certain overseas critics, who take delight in tabulating the obituary forecasts of various authorities.

Forecasts of a Few Years Ago.

It is, for instance, recalled that in 1901 Mr. John Hays Hammond made an estimate that seemed to indicate the working out of the Rand in 1926—twelve years from now. Mr. Hammond is, or rather was, most admittedly an authority on the Witwatersrand. He it was more so than any other engineer who pinned his faith to the deep levels and initiated schemes of development which have resulted in the reaping of a golden harvest from the deeper auriferous conglomerates. Mr. T. H. Leggett and Dr. F. H. Hatch are also men who stood in the very front ranks of South African mining engineers, and it is therefore curious to note that a year after Mr. Hammond made his estimate of a quarter of a century these two other gentlemen forecasted a life for these fields of 42 years. Three years ago Dr. Hatch revised his estimate and generously credited this gold field with another six to ten years' life—that at any rate is a fair interpretation to put upon his later prophecy. We are further reminded that in 1904, when the Johannesburg Municipal loan of 5½ millions was floated, the "life" of the industry was for purposes of that loan computed at 30 years. On the other hand, the Mayor of Johannesburg declared a few months ago that the reefs of the Witwatersrand will be unexhausted when this century is drawing to a close, whilst other responsible men prominently identified with the Rand have asserted that mining will be proceeding here on a large scale in the twenty-first century. Mr. Hull, when Minister of Finance, forecasted the future production of the Witwatersrand at two thousand million pounds, which on a basis of the present rate of production means 50 or 60 years.

Remarkable Discrepancies.

State Treasurers and Mayors of large cities are generally supposed to be well-informed people, but the difference between the views of Messrs. Hatch, Hammond, Hull, Leggett, Boustred and the Municipal loan assessors cannot fail to be remarked on. Last year two other estimates were formulated. Mr. G. A. Troye, also a mining engineer of repute, put the life of the Rand at 27 years from 1913. The Chamber of Mines Committee wisely refrained from signing any closely dated warrant of death, but the calculations tendered to the Economic Commission by that body are in some quarters assumed to corroborate Mr. Troye's figure. This study in inconsistencies is further illuminated by the estimate of the special commissioner of *South Africa*, the man who claims to have founded the Rand gold mining industry. Mr. Mather's paper, in dealing with the Chamber of Mines estimate, remarked: "We at once challenged the accuracy of this statement, which we described as misleading and gratuitously gloomy, and proceeded to quote the prediction of our special commission, who is now once again on his way to South Africa, to the effect that the Rand output will advance for twenty years, will remain at about the same figure for a decade, will decline slowly to the level of 50,000,000 tons per annum, at which it will stay for another twenty-five years, slowly waning after that for another fifty."

An Interesting Summary.

To summarise all these prophecies, and without quoting a number of other forecasts, we arrive at the following:—1901: Mr. Hammond says the Rand will last until 1926. 1902: Dr. Hatch and Mr. Leggett say until 1944. 1904; The Loan estimates authorities say until 1934. 1911: Dr. Hatch indicates a life until 1950, and in the same year Mr. Hull prolongs the period by about 15 years. Mr. Boustred then puts the date of exhaustion at A.D. two thousand and something. Next the Chamber of Mines gives evidence which is interpreted in some quarters as meaning that the Rand will be of very minor importance after 1940, and Mr. Mathers informs the world that the Rand will be productive until 2008! We do not propose to analyse these various prophecies; such action would be as futile as the prophecies themselves.

Changed Conditions.

It is now admitted that Mr. Hammond's 1902 estimate was based on false premises. The former chief consulting engineer of the Gold Fields did not reckon on working costs being reduced to the extent they have been. We firmly believe that long before the dates of exhaustion determined by other authorities have been reached it will be generally admitted that these other authorities also did not base their estimates on correct presumptions. Who at this date will make so bold as to say what changes in the economic aspects of the industry may not be effected before the end of the present decade? And since every little improvement, every little reduction in working costs must have a hugely important influence on millions of tons of ore, who can limit or determine the productive era of the Witwatersrand. In any case the death of the Rand is not going to be a sudden affair. The decline will be very gradual and protracted.

THE YEAR WITH THE TRANSVAAL COAL TRUST.

Points from the Consulting Engineer's Report.

In the course of his annual report on the property of the Transvaal Coal Trust, Ltd., Mr. C. E. Knecht writes:—

> Active production at De Rietfontein Colliery was suspended at the end of May for reasons mentioned in my last annual report. The tonnage produced by this pit for the five months ended 31st May amounted to 42,130 tons, and the aggregate sales since the commencement of operations totalled 1,993,341 tons. The manager's house and married quarters have been let. Such of the machinery and plant as could be utilised by Oogies Colliery were transferred and the balance will be disposed of as opportunity offers. The output at Oogies Colliery was increased by about 80,000 tons over that of the previous year but, latterly, a shortage of water was experienced which materially affected operations. Three boreholes were sunk for water, but in only one was any success met with. To further strengthen the water supply a second dam has been constructed. A number of additions to the equipment at Oogies Colliery were completed during the year and further additions are now under way to deal with the greater tonnage called for by the gradually increasing trade. Prospecting operations on certain farms held under option in the Breyten District were completed during the year, and in consequence of the indifferent results obtained the options were allowed to lapse. Boring has also been undertaken to prove certain other properties, but the results have not justified anything further being done.

East Rand Proprietary Mines.

The following information has been cabled to the London office of the E.R.P.M.: "The Main Reef series has been struck in the 28th level crosscut N., 225 feet from the Hercules vertical shaft, assaying 9·6 dwts. over 129 inches."

HARRISDALE SYNDICATE SECURES A TIN PROPERTY.

Promising Results from Van Rooyen's Portion of Rietfontein.

Prospecting for tin deposits and the exploitation of a number of promising prospects continues in the Waterberg district with unabated vigour, and it is considered that a number of new concerns will attain to some measure of importance in the very near future. In the vicinity of the Olifant's River a considerable amount of work is proceeding, whilst further to the south prospectors are busy in many parts of the Waterberg district.

The Harrisdale Acquisition.

The latest cassiterite proposition to claim notice is Van Rooyen's portion of the farm Rietfontein, adjoining Rietfontein of the Transvaal Consolidated Land and Exploration Co., and the Welgevonden Tin Mine under African Farms control. The Van Rooyen's portion has just been acquired by the Harrisdale Diamond Syndicate, and exploratory work is being pushed on with. Here the tinstone is found in a belt of shales and felsites bounded by granite. We learn that the existence of a stanniferous zone extending over 750 feet along an east and west strike has been established. Four trenches have been cut in this, and in the two eastern trenches a width of nine feet of tin-bearing ore has been disclosed. A width of two feet of this in the centre is very rich; an assay made of "chips" having given a value of 52·41 per cent. of metallic tin. As to the other, or western, trenches, these have also encountered good values, though not so high as those met with to the east. However, the prospector engaged in opening up this section estimates that the ore so far exposed will yield 10 to 15 per cent. of metal. Further to the west the stanniferous zone seems to veer around to that section of the farm, known as Tamsen's portion, and here cassiterite has been found in the surface soil. The trenches have not at the moment of writing been sunk to a greater depth than 3 ft., and it is at this juncture impossible to say anything definite as to the dip of the ore body or bodies. It may be remarked that this property has been acquired by the Harrisdale Syndicate on very favourable terms, and that the concern to-day which possesses the tin-bearing farm as well as the diamond property at Harrisdale in close proximity to the Vaal River has a capital of not more than £25,000.

VILLAGE DEEP DEVELOPMENTS.

High Angle of Dip in Lowest Levels Maintained— 1913 and 1912 Results Contrasted.

Development in the Village Deep mine has now been carried down to the twenty-second level in the Turf Mines section of the property, and it is important to note that at this depth the high angle of dip of the reef, which has been so noticeable in the Turf Mines area of this property, is maintained. The steep pitch of the reef in the bottom levels of this Central Rand mine at a vertical depth of 4,000 feet or more from surface is in marked contrast to conditions generally obtaining along the Witwatersrand where, as is well known, the almost invariable tendency is for the auriferous conglomerates to flatten as greater depths are reached. The high angle of inclination to the south observable in the lowest levels of this the deepest mine on the Central Rand means that the Village Deep Company over its whole area will average a substantially higher tonnage per claim than has hitherto been generally calculated on.

The Boreholes.

It may be recalled that two boreholes were sunk on the property of the Turf Mines, Ltd., some years ago, and from the disclosures of these boreholes it was estimated that the average dip was in the neighbourhood of 28 degrees. Subsequent survey proved that the borehole results were most unreliable, that there had been marked deflection of the holes, and that but little value could be attached to them as indicators of reef conditions. The dip of reef noted in the lowest levels of the Village Deep (Turf Mines section) is about 40 degrees, and this not only means a larger tonnage per claim, but it means also that shovelling and lashing can be more cheaply and effectively carried out than if the reef was flat lying. At the moment sinking below the 22nd level has been suspended, but the incline from the 17th level at the bottom of the Turf Mines shaft will, of course, be carried down a long way below this point, and it is intended to resume sinking at an early date.

1913 Results.

The results secured by the Village Deep Company last year were not so satisfactory as those obtained in 1912, and it is hardly necessary to state that labour troubles have been responsible, and wholly responsible, for the less satisfactory results of 1913 in comparison with those of 1912. The tonnage milled in the first place was about 60,000 less, whilst the revenue, judged from the totals of monthly returns, was about £90,000 less. The company accordingly distributed in wages, etc., £557,000 as compared with £594,000, whilst the profit earned declined from £295,000 to £242,000. On a unit basis figures were as follows:—Revenue per ton, 29s. 10d.—no change; expenses per ton, 20s. 9d.—10d. more; profit per ton, 9s. 1d.—10d. less. Despite labour scarcity, a large amount of development work was carried out during the year, and in this regard the annual report shortly to be issued will, it is expected, disclose some encouraging features.

The Use of Rescue Appliances.

The objections made by the Mining Association of Great Britain and the North of England United Coal Trade Association to the regulation proposed by the Home Office by way of amendment to the existing regulations relating to rescue work, came to a somewhat abrupt termination, in mail week, by an agreement between the objectors and the Home Office. The existing regulations contain in two or three places the words "breathing apparatus," and the Home Office appear to have been of an opinion that they could only refer to self-contained breathing apparatus. The coalowners, on the other hand, contend that any apparatus which, in accordance with Regulation 142 (a), enables the wearer to remain for at least one hour in an irrespirable atmosphere, complies with the requirements. Difficulties have arisen in connection with this construction, and the Home Office were invited to have the matter tested by an application to a court of law, but they have preferred, and we think wisely as regards the course, to apply for an amendment of the regulation so as to make it quite clear as to what the term "breathing apparatus" should mean. This course enabled the objectors to invite the referee, Lord Mersey, to consider the whole question

The best "Reef Traveller" is the *South African Mining Journal.*

THE POSITION AND PROSPECTS OF THE BRAKPAN MINES.

Points from the Consulting Engineer's Report.

Mr. C. E. Knecht's annual report on the Brakpan Mines, Ltd., is as follows:—

The year's operations resulted in 613,269 tons being crushed, which is less by 24,254 tons than that milled during 1912. The yield averaged 28s. 3d., working costs 18s. 9d. and working profit 9s. 6d. per ton milled, the total working profit being £2[illegible]0,790. The comparatively poor results of operations during 1913 were principally due, directly or indirectly, to the strike of July and its after effects on the native labour position, and, to some extent, to the less favourable tenour of development. The Managers Report shows that the average number of natives employed during 1913 somewhat exceeds that of the previous year. In the earlier, half, however, there was a considerable surplus, arising out of the restriction of operations through stope subsidence, whereas, in the latter half, there was such an abnormal falling off in consequence of the strike as to result in still further curtailment of the tonnage milled. In this connection, I would point out that, in periods of labour shortage, Brakpan must of necessity suffer more than other mines, because all ore is broken by machines. In mines where a certain proportion of the ore is broken by hammer boys, this class of labour represents a reserve in seasons of plenty, and, when a shortage occurs, machine drills are used to replace them. At Brakpan, it is impossible to create a reservoir, as it were, to balance the ebb and flow of labour in this manner, and in consequence the scale of operations is more sensitive to labour fluctuations than in other properties. Owing to the less favourable development of disclosures during the year, it became necessary to push this department regardless of the short labour supply, with the result that not only was the tonnage derived from development headings lower in value, but it's proportion of the mill mixture, in consequence of the curtailed rate of crushing, was abnormally high. Low grade ore from other extraneous sources increased by even a greater proportion, so that as much as 9 per cent. of the mill tonnage, which during the previous year had been drawn from the Payable Ore Reserve, was replaced by ore of much lower value. These abnormal circumstances alone lowered the mill grade to the extent of about 2s. 4d. per ton, of which fully 2s. was due to the reduced percentage of ore from the Payable Ore Reserve. It will also be remembered that during the early part of the year a temporary interruption of work was experienced in certain stopes owing to caving. Although these faces were soon recovered, the effect on the mill grade of the excessive amount of waste broken in re-establishing the normal hanging wall was considerable and lowered the average yield for the year as a whole by about 7d. per ton. Thus the unusual working conditions above referred to adversely influenced the mill grade by about 2s. 11d. per ton over the total tonnage crushed for the year. On the other hand the ore drawn from the Payable Ore Reserve was of a value somewhat above the average, the effect of which upon the mill grade amounted to about 1s. per ton. With regard to working costs, there were indications at the beginning of the year that 1913 would show improvement, but the unfortunate circumstances of an abnormal year were sufficient to upset all expectations based on ordinary probabilities. The higher development costs are the result of the increase as from the 30th June of the fixed charge of 1s. 6d. to 2s. 6d. per ton. The increase in the General Expenses at the mine is on account of the inclusion during 1913 of Phthisis Compensation and Insurance Charges, which amounted to about 4d. per ton milled. The increased costs, aside from the items mentioned, were due, especially during the latter half of the year, to the restricted scale of operations and the generally unsatisfactory position of both white and coloured labour resulting from the strike. During the first half of the year the extra expense involved in connection with the caved stopes also added a considerable amount to mining expenses. The development footage for the year totalled 19,650 feet, of which 15,793 feet were on reef averaging 7 dwts. over a reef width of 35.6 inches. The essential features of the payable development for 1912 and 1913 are as follows:—

	Payable Footage on Reef.	Percentage Payable.	Average Width. Inches.	Average Value. Dwts.
1912	7,895	63	39.5	11.8
1913	6,951	44	36.8	11.2

The reduced percentage of payable footage during 1913 is especially noticeable. The total expenditure on development amounted to £74,823, of which £59,972 was charged against working costs, leaving an amount of £14,851 to be written off against profits for the year. The cost of development during the year was equivalent to 2s. 7d. per payable mill ton developed, as compared with 1s. 2d. for the previous year. The Payable Ore Reserve as at 31st December, 1913, totalled 2,242,000 tons, of an average assay value of 6.7 dwts. per ton over an estimated stoping width of 61 inches. A shortfall of 215,000 tons has resulted when compared with the total a year ago, while the assay value remains practically unchanged. The decreased tonnage is attributable to the low percentage of payable development, the relative ineffectiveness as to tonnage of the payable footage, and the usual recasting of the position. As no material change in the average assay value has resulted since the estimate of 31st December, 1912, the average grade to the mill under normal labour conditions should apparently not be materially different from that indicated at the end of 1912, viz., 30s. per ton. In view, however, of the larger proportion of lower grade payable ore now produced from sources other than the Payable Ore Reserve, but more especially as it is the intention to maintain the policy of pushing development to the utmost, the proportion of ore to be drawn from the Payable Ore Reserve will probably be somewhat less than formerly. The normal expectation as to yield is therefore now somewhat lower and is estimated at about 29s. per ton. The labour position still leaves much to be desired, and until this improves, thus enabling the proportion of ore drawn from the Payable Ore Reserve to be increased to the normal standard, it is improbable that this figure will be reached. The position at present though showing some improvement during the past few months, is still considerably below former practice when labour was plentiful, and, should a coincidence or accentuation of adverse factors obtain, a yield of as low as 26s. per ton may at times be realised. The above estimates are based on average grade ore being stoped. Although this policy is always aimed at, it is found in practice that a varying degree of fluctuation unavoidably occurs from time to time. The accumulation of unpayable ore in the mine now totals 2,402,000 tons, of an estimated value of 2.4 dwts. per ton. This represents 38 per cent. of the total ore developed to date. A large percentage of this ore will require further exploratory work and, from past experience, is likely to add to the tonnage of payable ore. Owing to the short labour supply, it has not been possible to complete certain work undertaken to expedite the handling of ore at the No. 2 Shaft Station. Very good progress, however, has been made in extending haulage ways, the total footage accomplished being 4,479. A plan of the underground workings at the end of the year is attached, which also shows the areas stoped during the year 1913. The surface equipment continues to give satisfaction. Owing to the curtailed scale of operations it has not as yet been found necessary to erect the 40 additional stamps ordered during the year.

Kolmanskop Diamonds.

The Kolmanskop Company reports that during the year 1913 108,862 cubic meters of sifted gravel were treated, yielding 106,878¾ carats, equal to about 1 carat per cubic meter. The output as compared with last year shows a decrease of about 16,000 carats, but the shortage of labour and the heavy rains account for the shortfall. Satisfactory arrangements have been made with the Luderitzbucht Elektricitats Gesellschaft for the supply of current to work our machines. In the half-yearly report issued to shareholders reference was made to the fact that water was struck at the foot of the sand dunes, the supply from this source being sufficient for the requirements of one of the Schiechel machines. It is interesting to note from the general manager's report that a sufficient supply of water is now being obtained with which to work all the company's machines. In consequence thereof the agreement with the Koloniale Bergbau Gesellschaft has been terminated. The total profit for the year was £36,361 15s. 8d. The directors propose, subject to the approval of shareholders, to appropriate a sum of £4,000 to the reserve fund, bringing that fund to a total of £24,250. An interim dividend of 10 per cent. was paid in 1913, and the directors now recommend a final dividend of 20 per cent., making a total distribution of 30 per cent. for the year. Since its inception the company has paid the following dividends: 1909, 55 per cent.; 1910, 45 per cent.; 1911, 22½ per cent.; 1912, 30 per cent.; 1913, 30 per cent.; total, 182½ per cent. The annual meeting will be held on March 31.

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THE YEAR WITH THE WIT. DEEP.

Points from the Consulting Engineer's Annual Report.

The year's operations of the Witwatersrand Deep, Ltd., show a marked improvement on that of the previous year. The following important increases are to be noted compared with 1912: Tons milled, increase, 67,230; total yield, increase, £119,382; yield per ton milled, increase, 11·71d.; profit per ton milled, increase, 2s. 7·34d.; total profit, £98,221. The average cost per ton milled was 17s. 3·19d., or 1s. 7·63d. less than the average for the previous year. The improvement was more marked in the last five months of the year, when the average was 16s. 1·32d. Then the ore reserves are estimated at 1,666,000 tons of an average assay value of 6·8 dwts., which shows an increase of 173,700 tons, the value being practically the same as at December, 1912. Mr. D. Wilkinson, the consulting engineer, points out that since December, 1912, the influx of water has decreased from 1,925,000 to 1,375,000 gallons per day, and is now limited almost entirely to the eighteenth crosscut near the east shaft, where pumping facilities are more than ample to cope with it. In consequence, greater facilities had been afforded for development south of the water dyke, and the footage driven, raised and sunk had increased from 12,052 to 16,726 feet, or a gain of 4,674 feet. The development south of the water dyke has revealed satisfactory average assay values, the ore in sight east of the largest western transverse break and south of the water dyke being now 485,000 tons of an average assay value of 7·26 dwts. over a stoping width of 57·5 inches, and, so far, all the ore developed in this area has shown payable values. Mr. Wilkinson also points out that the milling capacity has been brought up to 52,000 tons per long month by the addition of one tube mill and an increase in the number of slime tanks. Altogether 518,230 tons were milled during the year, the total yield was £750,613, the yield per ton 28s. 11·62d., the cost per ton 17s. 3·19d., the profit per ton milled 11s. 8·43d., and the total profit £303,228. Dividends at the rate of 35 per cent. were paid. "The outlook at the mine," says Mr. Wilkinson, "is now more satisfactory than has been the case for the last three years, and, given sufficient native labour, the profits earned during 1914 should be considerably higher than during the year 1913."

IMPROVING PROSPECTS OF THE SIMMER DEEP.

Net Profit £4,984—Superintending Engineer Describes Prospects as "More Promising."

For the year 1913, the Simmer Deep made a profit from operations, after allowing for the expenditure of £2,064 2s. 3d. on renewals and replacements of machinery, plant, etc., amounting to £45,293 19s.; add interest and rents received, proceeds of sales of stands and sundry revenue, £10,880 1s. 3d.; total, £56,174 0s. 3d. Less: Debenture interest and expenses, £50,591 19s. 10d.; amounts written off, depreciation, etc., £597 2s. 7d.; total, £51,189 2s. 5d.; leaving a net profit for the year of £4,984 17s. 10d., which has been added to the amount of £49,608 15s. standing to the credit of appropriation account at 31st December, 1912, leaving the balance at credit of that account at 31st December, 1913, £54,593 12s. 10d. The Jupiter G.M. Co., Ltd., having recently suspended operations, arrangements have been made with that company for the use of such portions, as may from time to time be required, of its share of the combined ore reduction plant. Advantage will be taken of this arrangement as and when native labour conditions permit.

Mr. C. D. Lester writes:—The ore reserves at 31st December, 1913, are estimated at 1,416,000 mine tons, fully developed, of an average value of 4.25 dwts. per ton, and 254,000 mine tons, partially developed, of an indicated value of 4.4 dwts. The prospects of the mine are on the whole more promising than at the time of the last report. Development in the western section continues to expose a better grade of ore than is being opened up in the other parts of the mine. As the result of continued prospecting, further payable sections of South Reef have been indicated, which are sufficiently promising to warrant extending development on this reef in the expectation of adding to the profitable ore per claim as exposed by development on the Main Reef and Main Reef leader. In the lower levels the South Reef will be exposed by driving instead of crosscut raising from Main Reef, because these reefs are separated more widely from each other than in the upper levels. In order to increase profits by dealing with larger tonnage at reduced cost per ton, arrangements were made in October last for the hire of a portion of the plant belonging to the Jupiter Mine. The programme of testing in this way what the mine is capable of doing was upset on account of continued unrest as a result of the miners' strike in July last, which frightened natives away, so that the average coloured force was diminished during the latter half of the year by 851 natives as compared with the preceding six months.

SHAFT-SINKING PROGRESS AT THE SPRINGS MINES.

Consulting Engineer's Annual Review of Progress.

In his annual report for 1913 on the Springs Mines, Ltd., the consulting engineer, Mr. E. C. Knecht, writes:—

The reef was intersected in the North and South Shafts during March and August respectively. Sampling results of the reef disclosed in the shafts are as given in the Manager's Report. Permanent stations at the bottom of both shafts have been completed. The station roadways are practically completed and three main haulage ways at each shaft, also the Main Incline connection between the shafts, are well forward. As the Main Incline is advanced driving on reef will be taken in hand at intervals of about 600 feet. In the North Shaft section, the 2nd Level from the North Haulage and the 3rd Level, both East and West from the Main Incline, have already been started. The attached plan shows the position of the shafts and the underground workings at the end of the year. The total development footage at the North Shaft, including station and station roadways, amounted to 3,903 feet, of which 1,775 feet were sampled, averaging 9.6 dwts. over 27 inches. At the South Shaft a total footage of 1,846 feet was accomplished, of which 925 feet were sampled, showing an average of 7.3 dwts. over 43.5 inches. The total sampled footage for both shafts, particulars of which are given in the Manager's Report, amounted to 2,700 feet, averaging 8.5 dwts. over 32.7 inches. Development is not yet sufficiently advanced to permit classification as to payability, or to justify tonnage estimates. Development so far has been mainly confined to haulages and station roadways below the reef and sampling has for the most part been done by means of diamond drilling. The relatively small footage sampled is due to the station roadways in many instances having been driven in close proximity to each other, as required by the scheme of grading adopted, thus making further sampling unnecessary. Provision is being made for a possible influx of water as development progresses. At the North Shaft a temporary station has been cut at 1,800 feet, which will be equipped with a centrifugal pump, and a high-lift pump of similar type has been installed at the bottom station capable of lifting water to the 1,800ft. station. All the necessary cables and pipe columns are in position and pumping can be started at short notice should water be met with. As an additional safeguard, one engine is equipped with 600 gallon tanks and is now being utilised to bale the small quantity of water made in the shaft below the Dolomite Pump Station. The capacity of the plant now in readiness is about 1,000,000 gallons per diem. The permanent intermediate pump station at the South Shaft is completed. The shaft is equipped with electric cables to this station and the pipe column is being put in. The work of cutting the bottom permanent pump station is well advanced. At this shaft also one engine is equipped with baling tanks. The Dolomite Station pumps at both shafts have given satisfaction during the year, and the water pumped has been sold to the Rand Water Board.

PROSPECTING FOR RADIUM.

Many Tons of Ore go to Produce a Single Grain of the Precious Substance—A Grain Worth from £14,000 to £18,000.

The announcement that certain forms of cancer can be cured by radium applications, the establishment of the American National Radium Institute for the cure of cancer, the ever-increasing demand from Europe for the ores from which this most precious substance is extracted, all coming within a few months, have given a real boom to the mining of radium ores, a boom that would undoubtedly be greater than it is were it not for the fact that very few prospectors would know radium ore if they saw it, and fewer still would know what to do with it if they had it. Radium mining and reduction is something of a gamble. For radium-producing ore exists only in pockets in the rock, and it is impossible for anyone to estimate how much radium there may be in a "prospector's hole." The price of radium is prohibitive, except for very rich surgeons or for generously endowed institutions. This price is about one hundred and twenty dollars per milligram of radium metal. But radium metal does not exist in a pure state. It is on the market in the forms of radium chloride and radium bromide, which are bought and sold on the basis of the metallic radium they contain. The present price is equivalent, approximately, to 91,000 dollars a grain of radium chloride and 70,000 dollars a grain of radium bromide.

RICHEST FIELDS KNOWN.

The newly-discovered radium fields in Colorado are the richest known, but the highest estimate of the total quantity of radium in them all places it at only 900 grains; the highest estimate the experts of the Bureau of Mines have placed upon it is only about 180 grains, and this includes material of too low grade to be marketable. Most of the American radium is extracted from an ore called carnotite, which contains uranium oxide. Carnotite is a lemon-yellow mineral, usually found in pockets of sandstone deposits. The mineral may be in the form of light yellow specks disseminated through the sandstone, or as yellow incrustations in the cracks of the sandstone; or may be more or less massive, associated with blue, black, or brown vanadium ores. Pitchblende, the other ore from which radium is obtained, is a hard, blue-black ore that looks something like magnetite, but is heavier. It is found in pockets and veins in igneous rocks. This mineral is not nearly as widely distributed as carnotite. Occasionally it is found associated with an orange mineral called gummite. The best way to test these ores is to wrap, in the dark, a photographic plate in two thicknesses of black paper. On the paper lay a key and then, just above the key, suspend two or three ounces of the ore and place the whole in a light-tight box. Pressure of the ore on the key and plate should be avoided. After three or four days develop the plate in the ordinary way; and if the ore is appreciably radio-active, an image of the key will be found on the plate.

SEPARATING THE RADIUM.

The methods by which the miligram or so of radium is concentrated from the tons of ore through which it is spread are a secret. But the general principle is well known. It is not a smelting process, such as is used in extracting gold, or copper, or iron, but is purely chemical. The radium must be dissolved and then crystalized in the form of a salt—either radium chloride or radium bromide. The ore is crushed and placed in large vats into which a solution of carbonate of soda is poured. Heat brings the whole to the boiling point, after which it is filtered. More carbonate of soda solution is added for the purpose of washing out most of the sulphates. The liquid that results contains several alkaline earths, including the radium content of the original ore. This is now treated with pure hydro-chloric acid. This dissolves these earths. The radium has now to be precipitated from the rest of the mass. This may be done either by adding sulphuric acid, which forms a combination with the radium in the form of radium sulphate and has to be changed back into a carbonate by the addition of more carbonate of soda or the solution be saturated with hydrogen chloride, which precipitates only the radium and the barium chlorides, leaving the chlorides of lead, iron, calcium, etc., still in solution. These radium and barium chlorides are practically pure and ready to be separated and crystalized.

PROSPECTS OF THE MODDERFONTEIN DEEP LEVELS.

Crushing Plant to Start at End of 1914—Improving Labour Position Facilitates Completion of Development Programme.

In the course of his annual report on the Modder Deep, Mr. W. McC. Cameron writes, *inter alia* :—The two shafts of your mine are but 100 feet apart, and development has had consequently to proceed from practically the one point, with the result that the area has been opened somewhat slower than would have been the case otherwise. The places which have been particularly pushed are the main incline and raise in order to get additional levels started and the levels themselves to prospect the ground on the strike. Four levels have now been opened, covering a distance of 2,350 feet on the dip, and from end to end have been driven along the strike for 3,556 feet on "A" level, 4,688 feet main level, 2,260 feet 1st level, 312 feet 2nd level, and it will be seen that a large area has been prospected. Since development started in September 1912, 19,600 feet of work have been done; drives, raises and winzes amounting to 16,582 feet, of which 13,147 feet were on reef. The bulk of the better grade ore opened lies to the west of and on the dip below the shafts, where the reef is of excellent width. To the east the reef grows smaller and is of poorer value, though the position on this side is looking more satisfactory at present. The main east drive, after passing through a long stretch of unpayable ground, has now been on payable reef for a distance of 550 feet, of which the average value is 15.8 dwts. over 25.4 inches. On the whole, so far as disclosed, the reef conditions in your mine are very good, both as to width, which will have an important bearing on working costs and value. The ore reserves were measured and valued as at December 31st, with results as follows—Developed.—982,000 tons, average assay value 7.0 dwts over an assumed stoping width of 75 inches, of which 134,000 tons must be left as pillars to protect shafts. Partially Developed.—191,000 tons, average assay value 10.5 dwts. over an assumed stoping width of 62 inches. Probable.—In addition there are indicated as probably payable about 300,000 tons, on which the development work done is not sufficient as yet to enable a value to be assigned. The position of the mine as to reef conditions and values was so far established that I was able to recommend in August last the provision of funds to continue the development and the erection of a reduction plant to treat 30,000 tons per month, and all import orders for the plant have been placed, and work in connection with portions of it is already in hand. The plant should be ready to start at the end of 1914, and if labour conditions are favourable the mine should be ready to produce the required ore at the same time. Large quantities of water were encountered in March and June from faults cut in the main west drive; in the first case this water, amounting to about one-half million gallons per day, was easily handled by the pumping plant installed, but in June the total quantity rose for a short period to 1½ million gallons, and all work had to be stopped in order to assist the pumping plant by bailing at both shafts. Fortunately, all the water thus far met with drains off very rapidly, and the total water in the mine had fallen in December to 370,000 gallons per 24 hours. Early in 1914 pumping plant with a total capacity of over 2½ million gallons per day will be installed and place the mine in a very safe position in this respect. The white employees, with exception of staff, went on strike at the end of June in sympathy with the striking employees of the New Kleinfontein G.M. Co., Ltd. The strike was settled on the 5th July, but the conjunction of strike and water troubles caused a loss of about 2,000 feet in development work, and at the same time a heavy extraordinary expenditure. With the assistance of the staff the mine was kept free of water, and no damage of any kind other than loss of footage was suffered. During the first half of the year the native labour supply was ample, but the strike referred to caused the Government to stop the recruiting of natives, which was only permitted to start again in August, and an unusual number of natives took their discharges. At the time of writing the position is, however, looking much better, and your company can proceed with the greater portion of its development programme.

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THE POSITION OF THE JUPITER.

Points from the Annual Reports—Cash in hand £143,885—The Prospects of Resuming Work.

At December 31, 1913, the Jupiter had cash in hand amounting to £143,885. In his annual report, Mr. C. D. Leslie, the superintending engineer, writes:—"I attach a statement summarising the operations on your property for the period from January to October, 1913. The strike in July last had the effect of materially reducing the native labour force, which continued to diminish on account of the unsettled conditions prevailing, until it became recognised that there was no prospect in the near future of being able to extend the scale of operations to give the mine a fair chance for successful working, and that the mine, with a reduced scale of working, could not continue to be run at a profit. The wisdom of closing down the mine in October last was demonstrated subsequently, as there was a further depreciation in the labour supply on the mines of the Witwatersrand, which at the end of the year showed a decrease of nearly 30,000 natives as compared with the native force during the month of June, before the miners' strike took place. The prospects of resuming work are involved in settled conditions of labour, increase in the native supply, curtailment of the burdens placed upon the mining industry (particularly as affecting low-grade mines), advance in mining methods, and improved practice with water-fed machine drills. Large excess profits were made on the last two months of the period under review, partly because development chargeable to working costs was much curtailed, but principally because the mill was supplied almost entirely from the reserve of broken ore and sweepings which had accumulated in the mine. In resuming operations, the cost will have to be incurred of replenishing this underground reserve of broken ore. The ore reserves at 31st December, 1913, are estimated at 1,273,000 mine tons, fully developed, of an average value of 4·5 dwts. per ton, and 161,000 mine tons, partially developed, of an indicated value of 4·1 dwts. The small increase in grade, as compared with the previous year, is due to a better showing than may continue in the future in Main Reef Leader development in the eastern section of the mine.

THE YEAR WITH THE GEDULD PROPRIETARY MINES.

Increase in Costs Reflected in Lower Profits—Prospects of Extending Operations.

In his annual report for 1913, on the Geduld, Mr. W. McC. Cameron writes, *inter alia*:—The tonnage milled was increased by 14,220 tons, and the yield per ton increased to 28s. 1.4d. as compared with 26s. 8.8d. in 1912. Working costs on the other hand show an increase from 20s. 10.6d. in 1912 to 24s. 9.1d. per ton milled in 1913, and the result was a decrease in working profits, including sundry revenue, to £37,555, as compared with £56.996 in 1912. This result, due to the increase in working costs, is, on its face, unsatisfactory, but is very largely accounted for by the happenings in the month of July. The new plant was ready to be put into operation on July 1st, about one and a half months late, owing to the late arrival of machinery. In order to make the change, it was necessary to shut down the whole reduction works for about three days. When closed down and the changes in course of being made, a strike of white workmen, in sympathy with the striking employees of the New Kleinfontein G.M. Co., Ltd., was called, and all your employees, with the exception of the staff and a few sundry workmen, went out. Under such conditions the reduction plant might have been kept running at partial capacity by the staff, as was done in the later strike referred to below, but white labour could not be obtained to complete the change over, and the plant could not be run. The strike, owing to the poor protection which could at the time be given to the mines, was short lived, being settled on July 5th, and a complete victory for the labour unions. Men could not, however be obtained until July 8th to start again the work on the reduction plant, and then only a small crew, working in a half-hearted way and excited condition. The result was that the plant could not be started again until the 15th July, and then could only be run at partial capacity for the rest of the month, and instead of a profit in July, a working loss, deducting sundry revenue, of £13,880 was incurred. Other items, such as the additional quantity of water to be handled from the mine, heavy expenditure for increase of rock drill plant and cost of opening many new stopes also adversely affected costs during the year. You can, however look forward with confidence to a substantial decrease in working expenditure for 1914. The results of the last four months of the year, during which time the new reduction plant was running normally, but the mine was suffering from a severe shortage of native labour which prevented milling to more than 83 per cent. of the plant's capacity, was a working profit, including sundry revenue, of £28,185, while £1,712 was redeemed through working costs for development redemption in excess of expenditure on development. The new plant is giving the increased extraction anticipated, the average value of the residues from the time the plant went into commission to the end of the year, being 0.487 dwt. as against 0.658 dwt. per ton milled with the old plant during the first six months of the year. The apparent difference between the theoretical and actual extractions as given in the Manager's report is fully covered by the additional accumulation of gold in the larger plant. As far as breaking of ore is concerned, the mine has practically been put on a machine basis, 66.4 per cent. of the ore from stopes being so broken during the year, while in December the ore broken by machines had risen to 80 per cent. of the total. The amount of water pumped and hailed has risen by 77 million gallons to 704 million gallons for the year, and the cost of lifting this water to the surface, to £27,376, or 9.33d. per 1,000 gallons, while £3.242 appearing in sundry revenue account, amounting to 1.1d. per 1,000 gallons over the total water handled, was received for water sold. Although development work has been curtailed to a great extent since July because of the native labour shortage, yet the position of the ore reserves was considerably improved. The development ore reserves were remeasured at the end of the year, with results as fellows:—Developed.—1,757,000 tons, average assay value 6.9 dwts. over a stoping width of 58 inches. Of the above tonnage, 203,000 tons are required to be left as pillars to protect shafts and main levels. Indicated.—106,000 tons of probable ore by 2,125 feet of development work on reef. Average linear assay value of this footage is 6.3 dwts. over an assumed stoping width of 59 inches. It will be noted that for the first time sufficient knowledge of the mine is available to permit with safety a direct assay value being given for the developed ore. The development account stands in the books at £189.347, or 2s. 1.8d. per ton of developed ore, while 3s. 3.3d. per ton mined or 3s. 10.2d. per ton milled, was written off in 1913 for development redemption. The development charge was reduced from 4s. 6d. per ton milled to 3s. 3d. per ton milled as from August 1st last. This decrease was due to a change in the method of accountancy on which you decided. Much has been done in your mine during the year by way of improving the ventilation and allaying of dust, and the mine will shortly compare favourably with any on the Witwatersrand in these respects. The supply of native labour was very good up to the July strike, when recruiting was stopped by the Government, and only permitted to start again in August. At the same time an unusual number of natives took their discharge. The result has been an acute shortage of labour which has not yet been overcome. The labour which you have on the property at present permits of milling at about 75 per cent. capacity, with development reduced by 60 per cent. in order to free labour for breaking ore for the mill. It is anticipated that the labour position will improve considerably during the early months of 1914. The underground conditions point favourably to the mine being able later to supply ore to a reduction plant of considerably increased capacity, and the policy of the company should be to push on with development and incline sinking, when, labour permitting, the increase in plant could be taken in hand before the end of 1914.

A Diamond Case.

Judgment was given on Monday in the action brought by the Kolmanskop Diamond Mines, Ltd., against R. Walter, for a declaration that they were entitled to £5.000 worth of rough and uncut diamonds found upon the defendant when he was arrested in August last at Bloemhof, on charges under the Diamond Trade Ordinance, for which he is now undergoing imprisonment. The defendant was formerly employed by the plaintiff company as a sorter on its diamond fields at Kolmanskop, German S.-W. Africa, and the company alleged that the stones in question came from its property. The defendant called evidence to show that the stones have come from some other portion of the German S.-W. African diamond fields, but did not go into the box himself to explain how they came into his possession. The Court held that the evidence established that the stones were the property of the plaintiff company, and gave judgment in its favour with costs.

Rhodesian Section.

THE PRESENT STATUS OF RHODESIAN MINING.

Chamber of Mines Meeting—Mr. Wrey's Exhaustive Review—Overwhelming Importance of the Mining Industry—Expenditure and Dividends.

Up to the end of last year Southern Rhodesia had produced minerals of a total value of just under twenty-seven millions sterling, of which gold was by far and away the largest contributor, with a total of £25,281,000, coal coming next on the list with £681,000, closely followed by chrome iron ore with £639,000. These facts were alluded to by Mr. P. B. S. Wrey last week, in the course of his presidential address at the 19th annual meeting of the Rhodesia Chamber of Mines, held in Bulawayo. Mr. Wrey marshalled a host of valuable facts and figures regarding mining in Southern Rhodesia, and since in Matabeleland and Mashonaland, as in the Transvaal, gold mining is the principle industry of the country, the Chamber of Mines President's speech throws most interesting light on the prosperity and commercial aspect of the country. Some of the statistics adduced by Mr. Wrey are of particular interest in that they deal with aspects of Rhodesian mining that hitherto have received rather a meagre reference. At any rate we cannot recall having met with such a lucid statement in reference to the amount of money expended by the mining industry as is contained in Mr. Wrey's address. Rhodesian gold mining companies announce their output monthly to the Chamber, but unlike the particulars filed with the Transvaal Chamber of Mines, Rhodesian mining concerns do not record particulars of profit and working costs per ton except in the cases of certain individual companies. For this reason, and also because of the large number of small mines, for which profit figures are not available, it has hitherto been impracticable to arrive at figures for the Rhodesian industry as a whole.

Expenditure on the Mines.

Mr. Wrey pointed out that the mining industry of Rhodesia paid out in white wages to 1,850 workers an average wage of £30 per month, and to 34,000 natives an average wage of not less than 30s. per month. In additon, it is creating the market for a large amount of local, Cape and overseas products, which give large revenues to the railway companies. The bill for wages alone is close on £1,250,000 per annum, and for native foods £200,000, while allowing 8s. per ton crushed for the cost of stores, approximately another £700,000 is added to the money in local circulation, making the total from these three sources alone over £2,000,000 for last year, while if the costs of construction and development work carried out are added, a total of about £2,500,000 is shown to have been actively circulated by the mines during last year. Thus it is that any diminution of activity on the part of the Mines is bound to affect the business of the whole country.

Legislation.

Mr. Wrey made particular reference to recent mining law amendments, the most important of which are: (1) That it is optional to work under the 30 per cent. clause or the royalty basis; (2) work done prior to registration will count for purposes of protection; (3) Ground may be protected by a discovery notice pending the opening up of the area by means of trenching in order to discover the lode; (4) Royalty will be payable on the scale laid down for each metal produced; (5) Claim licences will be payable per month in lieu of for a minimum period of six months. Mr. Wrey's speech clearly showed that on the whole mining in Southern Rhodesia is in a much more satisfactory condition than ever hitherto. His address was couched in most moderate terms, but it is not difficult to discern a theme of justifiable optimism running through the whole oration.

Importance of the Industry.

The only regrettable feature in connection with the annual meeting of the Rhodesia Chamber of Mines is the not inconsiderable fall which was disclosed in the income derived from subscriptions of members, and the consequent necessity for a reduction of expenditure. It will be a thousand pities if the activities of this invaluable institution have to be curtailed. The Chamber of Mines is a real, live organisation which is maintaining constant watch over the interests of the great industry, on which Rhodesia almost entirely depends for its prosperity at the present day. How great is that dependence was strikingly shown by some of the figures quoted by Mr. Wrey. The past year was, of course, an exceptional one, owing to the great increase in the importations of machinery, which was getting on towards treble the amount imported in the previous year, and when one realises that three-quarters of a million of money has been spent in one year on reduction works, one obtains some idea of the progress which is being made. It will possibly come as a surprise to many outside the mining world to find that the cost of importing and erection is so high as 80 per cent. of the original value of machinery at the place of purchase. Such a figure amply justifies the reductions in railway rates recently announced, and tends to show that further reductions might not unreasonably be expected in the future. The exports indicate even more clearly the dependence of the country on the mines. It may be pointed out that the Treasurer, in his last Budget speech, described the industry as "the fountain head of all our resources. As to exports, the mining industry is at present responsible for 94 per cent., and the other industries of the country for 6 per cent., the latter amounting to less than £200,000. The total exports, excluding imported goods re-exported, were valued at £3,358,853, as compared with £3,017,634 in 1912. The principal mining products exported were 248 tons of asbestos, 26,000 tons of coal, 1,400 tons of gold concentrates, 24 tons of copper, 63,000 tons of chrome iron, and 837,765 ounces of gold bullion, equivalent to 28.7 tons.

Dividends paid out by Rhodesian mining companies last year totalled £548,920, as compared with £523,176 in 1912.

Native Labour.

Relative to matters concerning native labour, we would again direct attention to the satisfactory decline in mortality rates referred to in our last issue. The average number of natives employed on the mines in Southern Rhodesia in the year was a trifle less than in 1912 and something like 5,000 below the 1911 figure. Last year the number was 33,423, in 1912 it was 34,668, and in 1911 38,164. In view of the increase in the output these figures are rather curious, but the explanation apparently is that in 1911 there was more development work in progress. At the conclusion of the meeting the officers for the ensuing year were elected as follows: President, Sir William Milton (re-elected); hon. vice-presidents (re-elected), Sir Starr Jameson and Mr. E. W. S. Montagu; hon members (re-elected), the Mining Commissioner of Bulawayo, Mr. Fleming, the Director of Geological Survey, Mr. Maufe, and the Presidents of the Chambers of Mines of the Transvaal and Salisbury. The retiring members of the Executive were re-elected, viz., Messrs. Stewart, Griffin, Nairn, Drake, McDonald and Capt. Bucknall. Mr. Mitchell, in proposing the re-election of Mr. Wrey as President, paid a high tribute to that gentleman's work in the past. The nomination was unanimously agreed to. Messrs. Francis Drake and G. Stewart were unanimously elected vice-presidents. 1914 promises to be a most eventful year in the history of Southern Rhodesian mining and the industry is to be congratulated on having such an efficient band of workers at its head. It is confidently anticipated that this year's gold output will be at least 50 per cent. greater than in 1912, and it is to be hoped that this increase in production will be accompanied by an increase in the interest taken in that most valuable institution, the Rhodesian Chamber of Mines.

LATEST RHODESIAN MINING NEWS.

Globe and Phoenix—The Connemara—Rezende—Lomah Exploration—Susanna Mines—Hanover Mine—Chicago-Gaika—The Shamva—Antelope.

The following cable was dispatched from the mine to the London office of the Globe and Phoenix G.M. Co., in mail week by Mr. Piper, the company's consulting engineer:—Since my last visit consider prospects mine at depth have considerably improved both in regard to width of reef and values. No. 20 level face in the north end continuing in very rich ore

* * * *

Development on the Connemara mine was suspended at the end of June last, at which date the ore reserves were stated to be 264,425 tons, of an estimated total value of £419,149. The engineers report that these reserves should be considerably increased when development is resumed. The erection of a reduction plant capable of treating 6,000 tons per month has been proposed, and the necessary funds for this purpose will be provided at the first opportunity. The issued capital of the Connemara Company at the present date is £157,500, in 630,000 shares of 5s. each. The Chicago-Gaika Company owns nearly one-third interest in this mine.

* * * *

The report for the December quarter shows that the estimated expenditure on the Rezende section was £15,733, equal to 24s. 7d. per ton milled, the estimated profit for the section being £5,172. On the Penhalonga section the estimated expenditure was £11,256, or 9s. 2d. per ton milled, the estimated profit being £527. On the Old West section, the estimated working costs were £2,814 and the profit £1,835. The total profit from all sources for the quarter amounts to £7,535, but in view of the fluctuating prices of silver and lead, and owing to the fact that bullion and concentrates are realised in London, it will be understood that the above figures are estimated only and subject to audit. The summary of returns from all sections for the quarter shows that the quantity of ore milled was 47,620 tons, the revenue being £37,339, or 15s. 8d. per ton milled, and the operating cost £29,804, or 12s. 6d. per ton milled.

* * * *

The consulting engineer reports to the Lomah (Rhodesia) Exploration Company :—Kambanje Mine : No. 2 level (170 ft.) : West drive advanced 35 ft. ; total, 86 ft. from old shaft. For 43 ft. the average is 12.8 dwts gold per ton (reduced value) over 14 ins. ; last 25 ft. the average is 18 dwts. gold per ton (reduced value). At 43 ft. West a new shoot is entered, with improving values right up to face. Pannings prove the presence of much coarse gold.

* * * *

Mail week report :—Susanna Mine : 12th level spur reef, at 99 ft. a sample over 12 ins. assayed 17.1 dwts. ; evidence of reef widening South shoot winze at 127 ft. over 21 ins. assayed 10.2 dwts. Lady Lina : Main shaft at 73 ft. below 3rd level, sample over 24 ins. assayed 11.6 dwts. ; at 79 ft. sample over 12 ins. gave 7.5 dwts. Long John claims : Ore body shows assay value of 8½ dwts. over a width of 30 ft. The whole of this rock is being sent to the mill, it being taken out on the open stope system.

* * * *

Excellent news continues to come forward from the properties of the Hanover G.M. Syndicate, at Filabusi, says the "Rhodesian Mining Review." The output for last month was a record one, and a further record is promised for March. Recent developments have been confined to the Teutonic reef, but it appears now that active work is to be pushed ahead on the North reef and the Hanover reef. On the last-named an ore body some 200 ft. in length, assaying about 12½ dwts., over 3 ft., has been disclosed at the 300 ft. level. Last months dividend of 25 per cent. is the 9th paid out by the Syndicate during the past three years, and the prospects to-day appear brighter than at any time before.

* * * *

In submitting accounts for the year ended June 30 last, the Directors of the Chicago-Gaika Development Company, Limited, state that the profit and loss account shows a debit balance of £1,502. This amount, together with £177 for income-tax being deducted from the general profit and loss account, leaves a credit balance of £271. During the year under review, it was not possible to realise any of the company's shareholdings to advantage owing to the depression in all mining securities, and no dividend was paid during the year by the Gaika Gold Mining Company, in which this company is largely interested. The report of the Gaika Mine to June 30 last showed that 33,549 tons had been crushed resulting in a net profit for the year of £5,838. The falling off in profit as compared with the previous year was accounted for by the increased amount of antimony in the ore treated. The ore reserves at June 30 were stated to be 71,893 tons of an average assay value of 14.4 dwts. per ton, and 14,000 tons of rubble ore, averaging 3 dwts. per ton. At December 31 last the ore reserves were increased to 96,000 tons of an average value of 14½ dwts., and since that date some exceptionally rich ore has been found in the south drive, No. 10 level, north shaft, but of very limited extent. The prospects of the mine at the present date are reported to be most encouraging, and the monthly profits, which during the last six months have considerably increased, are expected to be maintained. An interim dividend of 1s. per share for the year ending June 30, 1914, has been declared.

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Discussing the Shamva Mine, Mr. Rowland C. Fielding writes in the "Times" :—

In the present case the costs have been estimated on a quarrying basis, and it is assumed that the ore will be similar to that developed in the upper levels—soft and easy to crush. But how long will these conditions last? With the exhaustion of the ore above the fourth level mining by shaft will become necessary; and already in the bottom of the mine the ore has become harder. In short, it is clear that conditions will have altered very materially in the not far distant future. The directors, in their last quarterly report, called attention to the fact that the results of the trial crushing, which had just begun, "and of probably the three first months' operations are not expected to represent the anticipated normal profit-earning capacity of the mine, for the following reasons :—First, owing to the fact that the grade of the broken ore, which will during that period be sent to the mill, is lower than the average mine grade; and, secondly, owing to the estimated preliminary absorption of gold in the tube mills, plates, zinc boxes, etc." They go on to say :—"It is possible, therefore, that the first month's running may show a loss, but that succeeding months should show a gradually increasing profit, whilst the normal output of gold should be reached during the fourth month." Until the company's accounts for the year ended December 31, 1913, are published it cannot be ascertained whether the proceeds of the issue of reserve shares made last July have sufficed to complete the installation and to finance the initial unproductive period of milling operations; but it may be assumed that the company starts crushing without any serious liabilities, and that the profit earning stage is, in any case, not likely to be long delayed.

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The working profit at the Antelope Mine during the month of January is reported as only £313, while the working costs were as high as £2 1s. An official note has been published, explaining that these high costs were due to the low tonnage treated, "caused by difficulties in connection with the new plant."

A New Rhodesian Line.

The harshest critic of the Rhodesian Administration cannot justifiably allege that the Chartered Company has not shown remarkable enterprise in opening up the country by means of railways. The Company may with reason be attacked on the grounds that they have shown but little enterprise in some other matters, but in regard to railways Rhodesia is in a remarkable position—for the number of white inhabitants it probably contains a greater rail mileage than any other possession of the British Empire. Yet another link in the chain of connections has just been forged. The Umvuma-Victoria line has been completed. Rails have been laid into Victoria Station and a week or two ago ballasting had been completed up to within a few miles of the terminus, and by this time the line is probably completed in this respect as well. The line passes through what is first and foremost a pastoral country, and it is probable that it will be of much greater moment to agriculture than to mining. But at the same time the district is not without mineral prospects. There are asbestos beds and cassiterite and copper deposits at no great distance from the new route. So far these deposits have not proved very successful, but with the better transport conditions afforded by the railway there is more than a possibility that they will achieve something in the future.

THE LIFE OF THE MAY CONSOLIDATED.

"Dependent on the Factors of Tonnage and Native Labour Supply."

In the course of his annual report, Mr. W. McC. Cameron, the Consulting Engineer, writes :—The tonnage milled was practically the same as in the previous year, while the yield decreased by 5s. 6.2d. per ton and the cost by 1s. 10.01d. The working profit amounted to £39,318, as against £69,663 in 1912. The yield per ton for the first six months of the year averaged 19s. 7d., and for the last six months 16s. 10d., and it is probable that a yield of about 16s. can be obtained for the remaining period of the mine's working existence. The life of the mine is now dependent to a much greater extent than any other on the one factor of the tonnage which can be produced, and, if sufficient labour is available, profitable work can probably be carried on for 8 10 months and £8,000 to £10,000 earned exclusive of gold in plant. A strike of a large number of the white workmen of your company took place on July 4th in sympathy with the striking employees of the New Kleinfontein G.M. Co. The strike ended on July 5th in complete victory for the labour unions, and all men were back at work on July 8th. Your company did not suffer very much through the few days interference with work, but has suffered very seriously since through the shortage of native labour which resulted from stopping of recruiting by the Government for several weeks on account of the strike, and the unusually large number of natives taking their discharges immediately afterwards. Your mine has now in its employment but 855 natives, as against the maximum during the year of 1,364 in April last, and the tonnage has dropped to such a point as to practically wipe out profits, but £228 being earned in January, 1914, though January results were further interfered with by the strike in that month. The rainy season, interrupting the work along the surface on the outcrop, has also had the effect of reducing the tonnage to a considerable extent. It is confidently anticipated that the labour position will improve during the early months of 1914. The measurable ore reserves as at December 31st, 1913, amounted to 61,350 tons of 6.33 dwts. assay value over the milling width, and a further 20,700 tons, having a value of 9.9 dwts., which must be left as shaft pillars. Of this latter tonnage it is probable that not more than 6,000 to 8,000 tons will be recoverable. A considerable tonnage can still be profitably produced from reclamation work and from areas which, as a whole, and standing alone, must be taken as unpayable. Another strike of the white employees, except the staff, reduction works men, and a few sundry workmen, took place on January 14th, 1914, as a result of a general strike for the whole Union called in sympathy with the striking employees of the Government Railways. The Government took such steps as soon put an end to this strike, and all of the ground lost in the previous July strike was regained. The work of the mine was interfered with but to a small extent, and there has been no further loss of natives on this account.

THE ASSAY OF TIN ORES.

A Review of Recent Progress and Improvements—A Standard Method Still Wanted.

A considerable amount of attention has been given in recent years to improving methods for assaying tin ores, more especially low-grade stuff, and though much valuable work has been done, a standard method for commercial work is still awaited. Surprise is sometimes expressed that a metal which has for so long been the mainstay of our metalliferous industry should be suffered to rest in the position of being the most difficult of the common metals to determine with objective accuracy. While the criticism is no doubt deserved, circumstances in recent years have considerably altered the position. The gradual rise in the price of tin and the increasing lowness of grade which it is possible to treat have very considerably altered the position from the point of view of the determinations which the assayer is ordinarily called upon to make. It is mainly in the department of the assay of tailings and slimes of low grade where a method of reasonable rapidity adapted to considerable quantities of material is required that the standard Cornish methods have required supplementing. Again the last few years have seen a very large amount of foreign ore imported into England, amounting last year to 34,592 tons, and the bulk of this is from lode mines, or from countries like Nigeria, of which the character and associations of the ore is as yet but little known. Fifteen or twenty years ago—when the supplies of tin were drawn mainly from the alluvial deposits of the East Indies and from Cornish mines, where the composition of the ores was well known—the modifications caused in the working of an assay by the association of certain other minerals did not possess the same practical interest. At the same time it is only fair to notice that as far back as 1860 it was thoroughly recognised among assayers that a vanner assay on poor tailings or waste was useless. Two exceedingly interesting papers on the subject of the assay for tin were presented before the Institution of Mining and Metallurgy at its last meeting, one discussing the Pearce-Low method by Messrs. E. A. Wraight and P. Litherland Teed, and the other by Mr. H. W. Hutchin devoted to the Beringer assay. The authors of the first named paper, by way of introduction, drew attention to the acknowledged difficulty of obtaining agreement among assayers as to determinations of tin in given ores as showing the inherent difficulty of the inquiry; and, in fact, it became clear before the discussion was adjourned for further contributions in writing that it was not necessary to go outside the room to find assayers indisposed to accept the results reported in the paper. It seems an unfortunate feature of discussions on tin assaying and tin dressing, which have necessarily to be compressed into a very short space of time, that it is often difficult to obtain agreement as to the actual data presented upon which the arguments of the authors or critics are based. It is not necessary to refer further back than Mr. Nicholl's paper on the dressing plant at Geevor, which opened up an exceedingly interesting question, but without in any way leading to a conclusion. In view of the widespread interest taken in the recent assaying papers, we are assured of a very extensive discussion, but whether any generally agreed conclusions will be reached seems at present more than doubtful.

The so-called Pearce-Low assay—consisting in the reproduction of the ore to tin stannate by fusion with sodium peroxide, followed by solution in dilute hydrochloric acid and reduction to the stannous state, followed after by titration with iodine—was found by the authors to be unaffected in the presence of zinc, lead, iron, nickel, arsenic, chronium, copper, manganese, uranium, calcium, aluminium, magnesium, sulphur, fluorine, boron and phosporus, at any rate in the case of rich ores, but serious errors were found to arise when the process was applied to minerals containing bismuth, tungsten and titanium. To summarise the results of a large number of experiments neglecting compounds containing bismuth, titanium and tungsten, out of forty results nine were absolutely correct, twenty-four slightly too low, and seven slightly above the actual tin content. In the second part of their paper the authors described a modification of the process permitting the elimination of titanium, tungsten and bismuth, which in their opinion gives results accurate within 2 lbs. per ton for rich ore, and 1½ lbs. per ton for 1 per cent. ores. The following is a summary of these recommendations :—

1. The degree of fineness of the ore must be at least 100-mesh, otherwise a representative sample cannot be obtained.
2. Nickel crucibles are superior to iron ones; the time of reduction is not so long if nickel crucibles are used for fusion. For tailings, fusion in an iron crucible should be avoided; it is desirable to keep the amount of ferrous chloride in the solution as low as possible, particularly when the tin content is small, otherwise high results are obtained.
3. The amount of hydrochloric acid should be about 125 c.c.
4. The bulk of the solution before reduction should be about 400 c.c.
5. The temperature of the tin solution at titration should not be more than 70 degs. F.
6. The strength of the standard solution should not generally be more than 11 grms. of idodine and 20 grms. of potassium iodide per litre, or less than one-third the above strength.
7. Before titration the calcite should have entirely dissolved.
8. Titanium, tungsten and bismuth must be removed before titration.
9. Copper and iron should, under special circumstances, be removed.
10. Nickel should always be used for reduction.

Mr. Hutchin's paper described further researches on the lines suggested by Mr. Beringer's method, and the opinion was expressed that the products of combustion were largely responsible for the completeness of the extraction. Experiments showed that zinc oxide and lime were superior to barium carbonate as diluents of the ore. The temperature of the reduction was, of course, affected by the diluents, and suggestions for regulating the furnace temperature were given.—"London Mining Journal."

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Engineering Notes and News.

IMPROVED PRACTICE IN WATER-FED HAMMER DRILLS.

Description of the Leyner-Ingersoll Drill—In Increasing Use on the Rand.

The Leyner-Ingersoll drill, though for some time familiar on the mines of the Rand, has not been much before the public, owing mainly to the inability of the makers to fill all the orders received. That difficulty is now overcome, and we are enabled to print a detailed description of the new drill:—As the pioneers in the exploitation of the water feed drill, the Leyner Company has taken out a great many strong and basic patents, which are, in this drill, combined with some of the latest patented features of the Ingersoll-Rand Co. This refers particularly to the valve, rotation, lubrication, the water feature and the system and method involved in its application.

Method Claims.

For the method of the drill, the following claims are made:—(1) The method of expelling rock cuttings from holes in rock during the process of drilling holes, which consists in simultaneously supplying to the holes during drilling operation, water and air, both under pressure. (2) The method of expelling rock cuttings from holes in rock during the process of drilling the holes, which consists in uniting and commingling compressed water and compressed air and discharging the combined stream under pressure at the drilling point during the drilling operation. (3) The method of expelling rock cuttings from holes in rock during the process of drilling the holes, which consists in commingling with a rock-drilling engine, water under pressure and a portion of the actuating fluid of the engine under pressure, and discharging said commingled fluids under pressure at the drilling point during the drilling operation.

Claim Covering System.

For the system it is claimed:—(1) In a rock drilling system, the combination with an operative air compressor, an air-supply system, and the rock-cutting drill bit, with a portable water storage tank, connected to said air-supply system, an air operating rock drilling engine, operatively connected with said air supply system, and operatively connected with said air actuated portable water storage tank, and means connected with said rock drilling engine for mingling said air and water together and for conveying said commingled air and water to the cutting point of said drill-bit, substantially as described. Patent protection has been extended generally in foreign countries.

J. Geo. Leyner, the inventor of the "Water Leyner Drill," is the pioneer in the invention, advocacy, manufacture and sale of drills constructed on the hammer drill principle which proved successful commercially. The first hammer drill which he brought out did not embody the water feature, but, realizing the value of cleaning drill holes of cuttings while drilling—and as the dust created by passing air alone through hollow drill steel to the cutting point prohibited the use of the drill, from a sanitary standpoint, as then constructed—he conceived the idea in the course of his experiments of passing air and water combined through hollow drill steel. Since the first model embodying the water feature was brought out Mr. Leyner has devoted his attention to simplifying and strengthening the application of the hammer blow principle and the combined use of air and water to rock drilling. New appliances of utility and convenience were added, until to-day the Leyner-Ingersoll has reached a remarkable stage of perfection, from standpoints of efficiency and economy of operation. It is in use the world over wherever mining and tunneling are in progress, this fact attesting its excellence. In general lines and principles involved, the former construction has been retained. The improvements incorporated consist principally in the application of the "Butterfly" valve action, thus increasing materially the drilling speed; the substitution of "IRCO" metal for vital cast parts; the "Sergeant" slip rotation, and the introduction of "Ingersoll-Rand" methods of treatment and manufacture of parts, insuring longer life to the machine as a whole as well as to each constituent part. The features worthy of special note are briefly summarized below:—The hand hammer blow: High drilling efficiency, low power consumption, light total weight. The water feature: Amelioration of the dust nuisance, going far toward elimination of "miners' phthisis"; greater cutting capacity; preservation of the drill steel. The oiling system: Continuous automatic lubrication with a resultant reduction in repairs due to machine running dry. The "Butterfly" valve: Greater number of blows struck, so that a light hammer, consequently a lighter blow, less destructive of drill steel, is used; absence of freezing tendencies under most severe conditions of air and weather. Sergeant slip rotation: Strong, positive rotation. "IRCO" metal: Insuring maximum life to the main constituent parts of the drill. Rock breaking effect: Holes may be placed where most advantageous for breaking ground, so that less powder is required.

General.

The principle of the blow delivered by this type of drill is that of the hand hammer blow mechanically applied. It

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is ideal in that it imparts all of its energy to and through the drill steel to cut the rock. It is not robbed of its energy in overcoming friction and inertia. The drill steel does not reciprocate; on the contrary, it rests loosely in the chuck and is struck by the hammer. The cutting end of the steel is close to or against the rock at all times; consequently the weight moved, that of the hammer alone, is light and constant at all times regardless of the length of the drill steel. The blows struck are great in number although light, so that the machine is not so destructive of drill steel, and loss of gauge of drill bits is not so rapid, owing to the non-reciprocation of the drill steel—hence steels are not dulled so rapidly, particularly on the corners which maintain the hole size.

THE WATER FEATURE.

The application of water and air to the bottom of the drill hole while drilling serves three purposes: (1) It lays the dust, thus greatly abating one of the principal causes of miners' phthisis. The average life of miners working with "dry" drills is very short and examinations of the lungs of miners, who have died with this disease, have shown as much as 20 per cent. extraneous matter. (2) It cleans the holes of the rock cuttings while drilling. This means that the cutting are ejected as soon as made, that the steel is cutting virgin rock at every blow—not wasting its energy in working through and pulverizing cuttings already made. Also, there is no delay due to "spooning out" the hole, and it is only under certain conditions that a blow pipe is ever used. (3) It keeps the drill bit cool, preserving the cutting edges and gauge, thereby reducing wear. Passing air alone through the steel is entirely impracticable, because the resultant dust is unbearable, although it will usually clean the hole, and water alone, even under pressure, cannot be used, for it will not clean the hole. The combination of air and water, both under pressure, seems to be the only satisfactory solution of the whole problem, and the practical way to combine them in the drill has required considerable study, experiment and experience.

The Mining Exhibition and the Inventor.

At the last meeting of the Chemical, Metallurgical and Mining Society, Mr. Cullen said that the committee had held a meeting a few nights previously to decide upon what should be done in order to bring the proposed exhibition to the notice of everyone interested along the Reef and in other parts of South Africa. They were having special bills printed, to be posted in all recreation halls of mines throughout South Africa. They hoped by these means to get the interest of all in the exhibition. Their idea was to encourage the small man to bring forward any devices to the notice of persons interested. In some cases such devices were not practicable, but in many other cases devices that might be practicable in preserving life or in reducing costs might be brought forward. It was impossible for the society to get into touch with all who had such devices, so they depended upon members of the society on the individual mines to bring the exhibition to the notice of those who might have devices. No one who was not a member was debarred from exhibiting, and no charge was made to exhibitors or to members of the public. He appealed to each individual member to do his best to get others interested. There would, of course, be the usual exhibits as in other years. It was hoped that great interest would be taken in the matter of ambulance work on the mines. The recent ambulance tests on the mines had brought to their notice many most valuable points, and it was hoped that devices exhibited would assist them in mine ambulance work. They hoped that as there was a great movement throughout the mining area with regard to ensuring safety, the exhibition would be of value in this important phase of the work on the mines.

International Electrotechnical Commission.

The report on "International Symbols" has just been issued by the I.E.C. (publication No. 27; to be obtained from the general secretary, Mr. C. le Maistre, 28, Victoria Street, S.W., price 2s. 1d., post free); is was unanimously adopted at the Berlin meeting of the Commission, and consists of certain rules of principle, together with a list of 56 symbols that have been officially adopted. A number of signs for the names of units and a few mathematical rules and smybols commonly employed by electricians are included. The International Electrical Congress at San Francisco next year will be asked to adopt the term "Siemens" for the unit of conductance. It is hoped that the symbols recommended by the I.E.C. will be widely adopted by lecturers, authors and others concerned with the study of electrotechnics. To a considerable extent the smybols correspond with those in current use. Fundamental requirements are that they must be distinguishable from one another when written on paper or on a blackboard, and that it must be possible to spell them out whilst writing them: the distinction between roman letters and italics, therefore, is abandoned, and small roundhand letters, as well as Gothic type, cannot be used. Suggestions are made in the report as to the course to be followed where the symbols habitually used by physicists and mechanical engineers occur in conjunction with the electrical symbols. The symbols recommended differ from those to which English readers are accustomed in very few cases. There are, however, some curious features in the lists. For instance, work and energy are allotted separate symbols: after numerical values capital letters, the initials of the names of the respective electrical units, are employed, but where these are combined with other letters, small type is used, so that, for instance, we get kWh. for kilowatt-hour. The symbol ω for ohms is abolished, as well as Ω for megohms, but substitutes have not yet been definitely adopted: O or Ω is provisionally recommended for ohms. The use of the comma or the full stop for separating decimals from whole numbers is left to follow the custom of the country, and an attempt is made to avoid confusion by substituting a space for either of them in writing whole numbers of four or more digits—thus, one million is 1 000 000. As the report is copyright, readers who desire to make themselves acquainted with its details must obtain copies of it from headquarters.

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Electric Light and Water Schemes.

The ratepayers of Harrismith have decided, with practically no opposition, to raise a loan of £10,000 to improve the electric light scheme and extend the water service.

Electric Traction: Hint for Reef.

In the "Transactions of the South African Institute of Electrical Engineers," Mr. S. E. T. Ewing discusses railless electric traction, and points out that the existence of the smaller Municipalities of the Rand is bound up with the success or failure of the neighbouring mines, and the mining industry is, at its best, a more or less ephemeral one. These facts react on the cost of borrowed money to such an extent that in investing municipal funds in any revenue-producing enterprise such as a tramway scheme the question of minimum capital outlay becomes of prime importance. Professor Dobson had told them that when everything was taken into account there was but a negligible difference in total costs between a railless electric system and the up-to-date motor omnibus. As this statement was based on a consensus of expert opinion, it might be taken as substantially correct, and it would be seen that as the capital outlay on trackless trams was much higher than on motor buses, the higher rates of interest and shorter loan periods pertaining to capital outlay in these municipalities against the British conditions quoted made the case so much the worse for the trackless tram. As an example of the difference in capital outlay required for the two systems, Mr. Ewing cited the case of certain estimates recently prepared for 10·88 miles of trackless tram route, allowing for six vehicles, sundry spare materials, car shed and transforming plant, but excluding generating plant as purchased power was to be used. The total figure amounted to £33,000, or £2,750 per route mile. Against this the estimated cost of six petrol-electric buses with spares and car shed was given as £9,200, or £846 per route miles. It must be apparent to any electrical engineer, says Mr. Ewing, that a really light, efficient and long-lived accumulator is the finest solution of the problem of short distance transport, offering as it does the promise of low running and maintenance costs with small capital outlay and great flexibility, a combination in short of the best points of electric tramways and motor buses. The new Edison Cell certainly brought that ideal vehicle within sight, and led him to think that the soundest policy for the outlying Reef towns to adopt in this matter of transport was to instal the best type of motor bus at present procurable (probably the petrol-electric variety), looking forward to its gradual replacement by the accumulator vehicle, rather than to sink much larger capital sums in inflexible overhead systems.

MINING MEN AND MATTERS.

The annual meeting of the Chamber of Mines will be held next Monday.

* * * *

The annual dinner of the S.A. Institution of Engineers will be held on April 25th at the Carlton Hotel.

* * * *

The ordinary monthly general meeting of the Chemical, Metallurgical and Mining Society of South Africa will be held in the Lecture Theatre, South African School of Mines, Eloff Street, Johannesburg, on Saturday evening, the 21st inst., at 7.45 o'clock.

* * * *

Mr. E. R. Syfret, the well-known public accountant, of Capetown, Senator Dr. Viljoen, of Caledon, and Sir Edgar Walton, M.L.A., who was formerly Treasurer-General of Cape Colony, have joined the Board of the National Bank of South Africa, Ltd.

* * * *

The list of certificates issued by the Mines Department for the fortnight ending 14th March, 1914, is as follows:—Mine Surveyors: B. E. Wolfe and B. C. Forrest. Engineers: Mechanical (Mines)—H. Sampson, H. T. Laity, J. Crofts; Electrical (Mines)—G. M. Robertson, E. Musgrave, J. Lave, D. L. Patrick, W. S. Carr, J. A. Kerr; Electrical (Works)—G. J. Moore; Mechanical (Works)—P. L. Brookes, W. J. Atkinson, R. Campbell. Mine Overseers (Metalliferous Mines): E. J. Darling, W. Holman, P. A. Rogers.

* * * *

By the courtesy of the directors and the general manager of the Crown Mines, Ltd., a visit has been arranged to the Crown Mines on Saturday afternoon, the 28th inst., by the Chemical, Metallurgical and Mining Society. Visitors will be divided into two parties, one underground and the other for the surface. The underground party will be somewhat limited in number, so that early application is essential to secure places in the party. Those wishing to visit the underground workings will meet at the South Rand shaft, at 1.30 p.m. sharp, from whence they will proceed underground to the 13th level, where the up-to-date methods adopted for handling rock underground, and the electric haulage, etc., will be shown, after which the crusher station and the new circular shaft will be visited. Members of this party should equip themselves suitably.

* * * *

The next monthly meeting of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 23rd March, at 8.15 p.m. Business: The minutes of the ordinary monthly meeting held on the 23rd February, 1914, will be read; election of new members. The following papers will be open for discussion: "Notes on a Form of Black Diamond from the Premier Mine," by David P. MacDonald, M.A., B.Sc.; "Notes on some Prehistoric Stone Implements found in Katanga," by F. E. Studt, A.R.C.S.; "The Granite Dykes of the 3,520 ft. Level, Kimberley Mine," by E. H. L. Schwarz, A.R.C.S. The following papers will be read: "Outlines of the Geology of German South-West Africa," by Eberhardt Rimann, Ph.D., M.E.M.Sc.; "The Occurrence of the Brazilian Trilobite *Pennaia* in the Bokkefeld Beds," by S. J. Shand, D.Sc., Ph.D.

Anglo-French Coal Estates: General Manager's Report.

Mr. G. R. Thom, the general manager, writes as follows in his annual report on this company:—Machinery and Plant.—The whole of the machinery and plant has been maintained in good working order. A smoke stack, 100ft. x 4ft. 6in. was erected at a cost of £272 13s. 4d. The following are in the course of construction, and will be in commission shortly:—One New Lancashire boiler, 28ft. x 7ft.; one new electric generating set of 123 k.w.; also a steam hammer and shearing and punching machine. The mine development, which has been entirely in lower seam, is very good. The development amounts to 6,500 feet, representing an area of 58.8 acres available for mining purposes, which yield 205,860 tons clean coal. The mechanical haulage has been extended throughout the year as occasion required, thus reducing tramming by manual labour to a minimum. There are at present under construction 100 new steel tubs of 24 c.f. capacity. The coal-cutting plant continues to work highly satisfactorily, the whole of the coal being undercut by machines. There are at present in the mine 24 Siskol cutters, 6 "C" type Siskol hammer drills, and two Flottmann hammer drills, being an increase of one cutter during the year. The supply of water from the pumping station on Elandsfontein farm has been satisfactory, and has practically met all requirements. To meet the increasing demands a dam wall is in course of construction at the pumping station to enable water to be conserved during the rainy season.

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Locomotive Tank for Steam, 4 wheels, Cylinders, 8 inches diameter by 12 inches Stroke, Standard 3ft. 6in. built to Main Line specification and with Copper Fire Box and Brass Tubes complete with Cab by Brush Engineering Co.; condition almost new, Wheel base short suit Shunting, Tipping and Hauling, price £275, say one third of cost, apply.—E GOODENOUGH, 37, Walbrook, London, England.

Finance, Commerce, and Industries.

Natal Coal Freights.

Mr. John Roberts, borough electrical engineer, has issued a pamphlet on coal freights, exposing the unfairness of the position, especially as it affects the local Durban user. Some time ago he was authorised by the Council to prepare this booklet, regarding which he says he is extremely hopeful of bringing his contentions to a successful issue. In a note accompanying a copy he adds: "But it is a question of pressing the arguments home, and I think it will be necessary for us to have a councillor down in Capetown to bring it before our members at the time the railway estimates come on." In his pamphlet Mr. Roberts says:—"Apart from agriculture, what is Natal's most important asset? Undoubtedly its coal, and how can it be most powerfully assisted? By carrying it at the lowest rates. Further, its industries, in common with industries in all parts of the world, depend on cheap power, or in other words, cheap coal. It follows therefore that low freights on coal have at the same time the most beneficial effects both on the development of our coal resources and on our local industries.

*   *   *   *

Cape Insolvencies in 1913.

Mr. Harry Gibson has prepared the following report for inclusion in the annual report of the Capetown Chamber of Commerce on the subject of insolvencies, transfers of landed property and mortgage bonds in 1913: Cape Province.—Voluntary: 1911, 229; 1912, 270; 1913, 303. Compulsory: 1911, 86; 1912, 111; 1913, 113. Totals: 1911, 315; 1912, 381; 1913, 416. Total assets (estimated in the case of compulsory sequestrations): 1911, £246,121; 1912, £329,727; 1913, £356,769. Total estimated liabilities: 1911, £503,996; 1912, £543,860; 1913, £593,694. Percentage of assets to liabilities: 1911, 48·82; 1912, 60·62; 1913, 60·09. Cape districts only.—Voluntary: 1911, 50; 1912, 50; 1913, 61. Compulsory: 1911, 34; 1912; 45; 1913, 45. Totals: 1911, 84; 1912, 95; 1913, 106. Total assets (estimated in the case of compulsory sequestrations): 1911, £79,288; 1912, £64,429; 1913, £99,756. Total estimated liabilities: 1911, £137,743; 1912, £106,886; 1913, £169,749. Percentage of assets to liabilities: 1911, 57·67; 1912, 60·27; 1913, 58·78. The number of rehabilitations have been 212, 201 and 187 respectively. The figures given are, as on previous occasions, approximate only, since the assets and liabilities in the case of voluntary surrenders are taken from the schedule filed by the insolvents, and in the case of compulsory sequestrations the information is taken from actual results, where the liquidation accounts have been filed. In a few instances only has it been possible to obtain fairly accurate particulars. An examination of the detailed records shows there has been a fairly heavy weeding out from both these classes, though there is still a sprinkling of cases where the main cause has been the holding of landed property purchased during times of inflation, and in respect of which the owners were unable to continue payment of heavy interest charges. Though no doubt entailing individual hardship, the result to the community at large of this weeding out has been by no means unhealthy. In continuation of the practice commenced in 1911, I give the figures for the districts in which the ports are situated:—

	No	Assets	Liabilities.	Per Cent.
Cape	106	£99,756	£169,749	58·78
East London	13	9,430	13,999	67·35
Knysna	2	818	1,379	59·27
Mossel Bay	3	2,073	2,601	79·83
Port Elizabeth	12	36,319	59,282	61·30
	136	£148,426	£247,010	60·12
Other districts	280	208,370	346,684	60·01
Totals	416	£356,796	£593,691	60·09

The last column shows that the percentage of assets to liabilities at the coast ports, taken as a whole, does not differ materially from that of the inland districts, and considering the large increase which has taken place in the volume of trade during the past year I am inclined to think the figures may be taken as those of a more or less normal position.

*   *   *   *

Transfers of Landed Property in 1913.

The figures for the Capetown Registry, according to Mr. Harry Gibson, are as follows:—Number of transfers: 1911, 9,102; 1912, 9,847; 1913, 10,522. Value of properties: 1911, £4,382,462; 1912, £5,144,414; 1913, £6,655,555. New bonds passed: 1911, 4,585; 1912 5,269; 1913 6,211. Total value: 1911, £4,212,101; 1912, £5,026,583; 1913, £6,387,674. Bonds cancelled: 1911, 5,342; 1912, 5,345; 1913, 6,067. Total value: 1911, £3,213,612; 1912, £3,440,565; 1913, £3,950,616. Leaving an increased indebtedness of: 1911, £998,489; 1912, £1,586,018; 1913, £2,437,058. It will be noted that the figures show an increase under every head, resulting in an increased indebtedness of nearly two and a half millions sterling—a figure which we must go back to 1908 to find equalled. The large increase in the figures relating to both values of land transferred and new bonds passed is undoubtedly due to the demand—apparently greater than ever before—for irrigable land or land which has actually been brought under irrigation, writes Mr. Gibson. In certain districts land which some six or seven years ago fetched £3 per morgen, and for which a good supply of water for irrigation purposes has since been secured, has been sold at prices ranging from £16 to £50 per morgen. In other localities even higher figures—ranging from £60 to £200 per morgen—have been paid. In these cases the land, or at least some considerable portion thereof, has no doubt been brought into a fair state of cultivation, and possibly included well-established lucerne fields. This it not the first occasion on which I have drawn attention to this feature. Prices generally for farms all through the Province appear to have shown an upward tendency. Another factor in the situation has undoubtedly been the reduction of the rate of transfer duty from 4 per cent. to 2 per cent., which, as anticipated in my last report, has since come into force. Taken all round, the figures show a continued expansion in values, and are evidence of the general prosperity at present existing in the more cultivated portions of the Province. There is no doubt the agricultural community have in recent years developed that industry, and perhaps in no direction more so than in connection with the supply of water generally, whether by means of irrigation schemes, dams, windmills, or other mechanical systems, and the results have been distinctly gratifying. There are those, however, who incline to the view that the prices being paid for irrigable and irrigated land is some districts can only be justified by the returns hitherto obtainable from one particular industry, viz., ostrich farming—and the recent heavy drop in the prices of feathers has made investors stop to think whether the prices in question can be maintained.

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Insurance Questions.

The Chairman of the African Guarantee and Indemnity Company, at the annual meeting last week, referring to the large number of claims in the live-stock section, said he was confident that diseases, particularly anthrax, were scattered through want of supervision, because there was not a sufficient number of inspectors. Referring to the automobile section, he said it required minute attention, and they declined to insure motor cars purchased on the instalment plan. He knew that homes were frequently mortgaged for the purpose of raising funds to acquire automobiles, and scores of cars were being purchased on the easy payment plan. The importation of motor cars increased from £288,775 in 1910 to £1,100,867 in 1913, and assuming only 25 per cent. was written off annually, there was the enormous sum of over a million sterling practically vanishing at the end of four years. The question was how long could this small country, under the existing order of things, stand it? The craze to own a motor car instead of paying for the home must have its set-back swift and sure.

THE WEEK IN THE SHAREMARKET.

Quiet and Awaiting Developments—London Markets Inactive.

THE Provincial Council elections and the political troubles in Europe and America have co-operated to keep markets quiet this week. There has been little buying of the more speculative Rand stocks, but investment descriptions have been quietly picked up. It cannot be disguised that, by the Labour victories at the Provincial Council elections this week a new and variable factor has been added to the many that govern the inflow of capital to South Africa. In sympathy with the rest of the market, tin and diamond stocks remain quiet and diamond syndicates have attracted even less attention than usual.

* * * *

	Fri. 13th.	Sat. 14th.	Mon. 16th.	Tues. 17th.	Wed. 18th.	Thur. 19th.
Adair-Ushers	0 4*	0 4*	—	0 5*	—	—
African Farms	13 3*	13 6*	13 6	13 6*	13 3*	13 3*
Apex Mines	—	18 6*	18 9*	18 6*	18 3*	18 6
Bantjes Cons. . . .	13 9*	13 6*	13 6*	13 0*	13 6*	13 6*
Benoni Consolidated .	1 10*	1 10*	1 10	1 11	—	—
Blaauwbosch Dias. .	90 0†	90 0†	—	90 0†	90 0†	—
Brakpan Mines . . .	45 0*	—	—	45 0*	45 0*	—
Breyten Collieries . .	29 0*	29 0*	28 6*	29 0*	29 6*	29 0*
British S.A.	*19 0*	—	—	18 6*	—	—
Bushveld Tins . . .	—	0 7*	0 6*	0 9†	0 6*	0 6*
Cassel Coals	—	13 0*	13 6*	13 6*	13 6*	13 6*
Cinderella Cons. . . .	5 9*	—	6 6†	—	—	—
City and Subs. . . .	44 0*	45 0	45 0*	46 0*	46 6*	46 6
City Deeps	59 6*	59 6*	61 6†	59 0*	58 6*	57 6*
Cloverfield Mines . .	4 9	4 6*	4 9	4 6*	4 6*	4 6*
Clydesdale Collieries .	9 6*	9 6*	9 0*	9 0*	9 6*	9 0*
Concrete Construction	2 3*	—	—	—	—	—
Con. Langlaagtes . .	29 3*	29 3*	29 0*	—	—	29 6
Con. Main Reefs . .	17 6*	17 9	17 6*	17 9	17 6*	17 8
Con. Mines Selection	—	8 0*	8 3*	—	—	8 6*
Coronation Freeholds	0 4*	0 4*	0 4*	0 6†	0 6†	—
Coronation Syndicates	—	3 6†	—	—	—	—
Crown Diamonds . .	8 3*	8 3	8 3*	8 0*	8 3*	8 3
Crown Mines Deb. . .	£98*	£98*	£98*	£98*	£98*	—
Doornhoek Tins . . .	0 9†	—	—	0 3†	0 3*	—
East Rand Centrals .	2 0*	2 0*	2 0*	2 3	—	—
East Rand Coals . . .	1 6*	1 6*	1 6*	1 6*	—	1 7*
East Rand Deeps . .	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
East Rand Props. . .	38 0	38 6	—	37 6*	37 6*	39 0†
East Rand Debs. . .	£84½*	£87†	£87†	—	—	—
Eastern Golds	1 1*	1 1*	1 1*	1 0*	—	1 0*
Frank Smiths	5 6	5 7*	5 6*	5 4*	5 5*	5 5*
Geduld Props.	—	24 3*	24 9†	—	23 0*	22 9*
Geldenhuis Deeps . .	—	—	26 0†	—	26 0†	—
Glencoe Colls.	6 9*	—	—	6 9*	6 9*	—
Glynn's Lydenburgs	10 0*	—	—	—	—	—
Govt. Areas	19 3	19 3*	19 3*	19 0	18 10	18 9
Jumpers	—	4 3*	—	—	—	—
Jupiters	4 0*	—	4 6*	4 6*	4 9*	4 9*
Kaalfonteins	—	—	0 4†	0 3†	—	—
Klerksdorp Props. . .	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Knight Centrals . . .	9 6*	9 6	9 7*	9 9	9 6*	9 8
Knight Deeps	34 0†	—	—	—	—	—
Lace Props.	2 6*	2 6*	2 9*	2 10*	2 11*	2 10
Luipaardsvlei Est.. .	—	9 6*	10 0*	—	9 9*	10 0*
Lydenbg. Golf Farms	2 9*	2 9*	2 9*	2 9*	2 9*	2 9*
Main Reef Wests . .	—	8 0*	8 6†	7 6*	7 6*	7 6†
Middelvlei Estates .	1 0*	1 0*	1 0*	1 2	1 0*	1 0*
Modder B.'s.	—	—	—	—	83 0†	—
Modder Deeps	41 0*	42 9	42 9*	42 6*	42 0*	42 0*
Natal Navig. Colls. .	15 0*	—	15 0*	—	—	—
New Boksburgs . . .	—	0 9*	0 9*	1 0*	0 9*	0 9*
New Elands	27 0*	27 6*	27 6*	27 6*	27 6*	28 0
New Era Cons. . . .	—	5 0*	5 9*	5 9*	—	5 9
New Geduld Deeps .	2 0	1 11*	1 10*	1 10*	1 11*	1 11*
New Heriots	—	—	—	46 0*	—	—
New Kleinfonteins .	23 6*	23 3*	23 0*	22 9*	23 0*	22 9*
New Modders	240 0*	241 3*	240 0*	240 0*	—	242 6*
New Primrose	—	30 0*	—	—	—	—
New Rietfonteins . .	2 3*	2 3*	2 6†	2 6	—	2 6*
New Unifieds	16 0†	—	—	—	—	—
Orange Diamonds. .	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
Pigg's Peak	—	9 6*	10 0*	10 6*	10 6*	10 0*
Pretoria Cements . .	47 0	—	—	—	—	47 0†
Princess	—	5 9†	—	5 6†	—	—
Rand Collieries	—	—	2 0*	—	—	—
Rand Klips	2 4*	2 4*	2 4	2 3*	—	2 3*
Rand Nucleus	—	1 9*	1 7*	—	—	—
Randfontein Deeps .	—	—	—	—	—	3 0*
Randfontein Estates	22 0*	21 9*	—	—	—	21 3*
Robinson Deeps . . .	—	—	—	—	—	31 0†
Rooibergs	25 0*	25 0	25 0†	24 6*	24 6*	25 0
Rose Deeps	42 6*	42 6*	43 6*	43 6*	—	43 6*
Ryan Nigels	—	3 0	—	—	—	—
Shebas	5 0*	5 0	5 0*	5 0*	5 0*	5 0*
Simmer Deeps	2 0*	2 0*	—	2 0*	—	2 0
S.A. Breweries	38 0*	40 0	40 0*	40 6†	—	—
S.A. Diamonds . . .	30 0*	—	30 0*	30 0*	30 0*	30 0*
S.A. Lands	3 1*	3 0*	3 0*	3 0*	3 0*	3 0
Springs Mines	14 0	—	—	—	—	—
Sub Nigels	11 9*	11 9*	11 9*	11 6*	11 6	11 0*
Trans. Coal Trusts . .	31 6†	28 9*	29 0*	—	28 0*	27 9*
Trans. G.M. Estates	42 6*	42 0*	41 6*	40 6*	41 3*	41 3
Tudors	2 0†	1 0*	1 0*	—	—	2 0†
Van Ryn Deeps . . .	41 9	41 9*	42 0	42 0*	41 9*	41 9
Village Deeps	33 6	33 6*	34 9*	33 6*	35 6†	34 9*
Vogel. Con. Deeps . .	—	—	—	—	—	0 9*
Witbank Collieries .	—	45 0†	43 6*	—	42 6*	—
Witwatersrands	—	66 0*	—	66 6*	66 3*	66 0*
Wit. Deeps	50 6*	50 6*	50 6*	50 0	50 0*	50 0
Wolhuters	14 3	14 3*	14 9*	14 9*	14 9*	14 9*
Zaaiplaats	27 9*	27 6	27 0*	27 6	28 0	28 0*

*Buyers. †Sellers.

New S.A. Companies Registered in London.

AFRICAN MINING COMPANY, LTD.

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INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

March 27.—Simmer Deep; Jupiter (annual); Wolhuter Gold Mines; Buck's Reef (annual).
March 31.—Cassel Coal Co. (annual).
May 6.—Van Dyk Proprietary; Lancaster West; Tudor; Modder Deep Levels; Geduld Proprietary; Princess Estate; May Consolidated (annual).
May 20.—Apex Mines, New Kleinfontein (Annual)
May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).
June 23.—Transvaal Consolidated Lands (annual).

"Safety First" Appliances a Special Feature

at the Mining Exhibition, Johannesburg, 10-29 May, 1914 (organised by the Chemical, Metallurgical and Mining Society of South Africa.)

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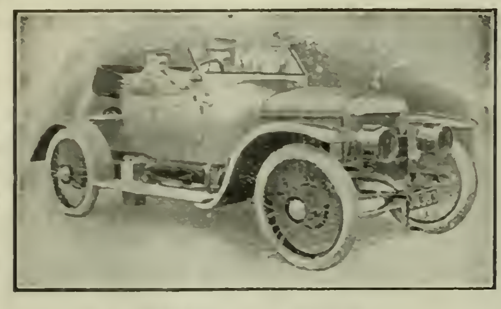
Fuller particulars will be announced shortly.



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Automobile Notes.

Motor Fuels and the Future of Alcohol.

Lecturing before the Royal Society of Arts, London, recently, Dr. Ormandy, in dealing with the important question of motor fuels, brought forward many interesting facts and statistics as to the origin, present position, and possible limitations to the supply of coal and petroleum products. He then proceeded to deal with the future of alcohol, and, so far as our space permits, we quote from his views on this interesting topic:—"There is every reason to believe that any difficulties which may be in the way of using alcohol as a motor fuel are by no means insuperable, and, on the other hand, there are many theoretical, chemical and physical reasons why alcohol should yield superior results. It can be employed without danger of pre-ignition under high compression, it can yield a much higher percentage of its available heat contents in the form of work, and for carburetting purposes it is much more homogeneous than the other fuels with which it competes. Assuming for the moment that methylated spirits can be used in admixture with benzene in the existing type of engine with slight modification to the carburetter, we open out at once the possibility of trebling the amount of fuel which could be obtained from coal alone, and as the use of such mixtures spreads manufacturers would undoubtedly so improve their carburetters and their engines that the proportion of benzene could be gradually reduced, and in this wise the almost insuperable difficulty of passing over from a type of engine of which millions are in existence to a modification thereof would be overcome. Let us now turn to the second equally important aspect of the question, that of production, with which is intimately bound up the question of denaturing, and the incidence of the excise laws. Alcohol can be made from all starch and sugar-containing bodies, and is, indeed, made in all quarters of the world on an enormous scale—in Germany from potatoes, in France from beetroot, in Japan and China from rice, in the tropics from cane sugar, and elsewhere from starch-containing grains, such as barley and maize. It has been urged that although great efforts have been made in Germany to encourage the use of industrial alcohol, it has made no headway as a motor fuel. I have given the reasons for this elsewhere at considerable length, but, briefly, it suffices to say that the manufacture of alcohol from potatoes in Germany is regarded as a question of national economic interest, and that the alcohol which is employed for industrial purposes has been bounty-fed at the cost of duties imposed on alcohol used for potable purposes. The German motor manufacturer has always had a larger market outside his country than in it, and it is not likely that he would develop an engine type for a fuel only to be found in his own country and which would be useless outside its borders, particularly when the price of that fuel is regulated by a number of considerations which are entirely outside his knowledge and control. We know, for instance, that alcohol can be, and is being, produced in very considerable quantities from the residual of material left from the manufacture of what is known as sulphite wood pulp, and we might reasonably ask how much of such residue is produced and what it would yield. We know that processes have been invented for the conversion of cellulose bodies, such as saw dust, into alcohol, and, once a large market was made available, no doubt the progress of such inventions would be much more rapid. At present the production of alcohol is hedged about with such restrictions, and the utilization of the finished product hemmed in with so many difficulties, that the inventor is inclined to regard the whole field as unworthy of serious work. In 1904 a Departmental Committee on Industrial Alcohol was formed. At that time petrol was about 1s. per gallon or less, and although the conclusions of this committee were adverse to immediate action, they were careful to leave an open door by stating that, once it had been proved that alcohol could be employed with advantage in modern motor or some modification thereof, and that the price of the competitive fuel rendered possible the application of alcohol, the Government would be prepared to consider the matter anew. Whatever may be the situation in this country—and that requires and deserves immediate and close consideration—there is not the slightest doubt that alcohol can be produced in large quantities and at reasonable prices, in many of our Colonies. It is in the lands of greater sunshine that starch and sugar products can most readily be produced, and this country has Colonies where the raw material for the production of alcohol can be produced in enormous quantities—the officials in these countries state, in practically limitless quantities at a price equivalent to 3d. per gall. for 95 vol. per cent. alcohol. To this must be added the cost of plant, fuel and wages, items which grow less in proportion as the output increases. The Imperial Motor Transport Conference, held in London in the summer of last year was attended by representatives of almost all our Colonies, and we can ask for no stronger evidence as to what our Colonies need, and think they can supply, than to turn to the final resolution passed at their meeting. What is required at the moment is practical work. We must find out what are the minimum modifications to the existing type of motor which will render it capable of economically employing alcohol-benzene mixtures. We want to know the limiting composition of such mixtures before their use leads to a drop in efficiency which points to something different in design. There are a great number of fuel mixtures to be investigated with a view to finding out which, if any, possess peculiar physical properties, such as maximum vapour tension and minimum boiling-point, which would render them particularly suitable for our special purpose. We ought to work hand-in-hand with the Government authorities on the question of denaturants. There are numours of new processes for the production of crude methyl alcohol which should be inquired into, since up to now the Government have insisted on a large percentage of this expensive material as a necessary ingredient in their denaturing mixture. Any reduction in the price of this crude methyl alcohol, at present obtained only from the distillation of wood, would be of importance in our new development. We should have available statistics as to the output of starch-containing bodies in all our Colonies; in fact, there are some years of difficult and expensive work before us, but without such work the development of the next ten years in this direction will be that of the last 10 years."

The need for better roads is so generally felt in countries where motoring is becoming the recognised mode of travelling, that means towards the attainment of these are being eagerly seized wherever they present themselves to responsible authorities. Two States in America have framed particularly effective laws regarding the working of convicts on highways. In West Virginia the law provides that any male person over sixteen may be sentenced to road work instead of to the district gaol, and, moreover, persons charged with misdemeanours, who are unable to furnish bail, must work on the roads. If, when tried, they are acquitted, they are paid 50 cents for each day's work completed. In Iowa prisoners employed on the highways receive a certain portion of their earnings above the cost of their keep, but the bulk is either funded or given to their dependent families.

Marievale Nigel.

No mining work was done at the Marievale during last year, and the excess of expenditure over revenue was £243 13s. 3d. After providing for amounts due to shareholders, on account of the reduction of the capital, and not yet claimed, and for small sundry creditors and debtors, the company's available cash balance on the 31st December amounted to £8,795 14s. 7d.

The Week's Company Meetings.

CROWN MINES—ROBINSON.

Formal Meeting.

Robinson and a Reply.

Meetings of the Crown Mines and Robinson Companies were to be held at Corner House this week to consider the question of fusion; but owing to opposition on the part of certain shareholders of the Robinson Company to the proposed purchase by the Crown Mines, the directors of the Robinson approached those of the Crown Mines with a view of obtaining their consent to the abandonment of the provisional agreement, and this was given. Instead, therefore, of to-day's meetings ratifying that agreement, they were merely formal, though that of the Robinson had to be adjourned for a week owing to the absence of a quorum. Next Monday, at the adjourned meeting, however, the Chairman will make a statement in view of the form which some of the criticism against the scheme has taken.

At the Crown Mines meeting Mr. Samuel Evans presided, and in the course of his remarks said: You will remember that at the annual meeting in June last I referred to the possible acquisition by your company of the property and other assets of the Robinson Gold Mining Company. I then pointed out that the proposal, if carried out on a fair basis, would be mutually advantageous, as we recognised that in the case of a mine like the Robinson a time would come, long before it had exhausted all its ore reserves, when it and the company absorbing it would stand to gain by a fusion. The matter was very carefully considered by the directors and the engineers on both sides, and a provisional agreement was entered into on the 18th of December last. This was communicated to you by circular dated the 13th of January, and this meeting was called to consider the proposal. The purchase consideration payable by your company for the assets of the Robinson Gold Mining Company was to be 180,000 shares, and the Robinson shareholders were also to receive a dividend of 7s. per share and to retain for distribution among themselves the 40,000 Crown Mines shares owned by the Robinson company. In our opinion these terms were fair and equitable to both groups of shareholders. However, a number of Robinson shareholders considered the price to be paid by your company insufficient, and they agitated for the cancellation of the provisional agreement or a modification of the terms. As a result, your directors were asked by the directors of the Robinson Company to consent to the abandonment of that agreement. About the same time two of our largest shareholders informed us that they were agreeable to the course proposed by the Robinson directors. They added that they felt constrained to withdraw their support of the proposed amalgamation in view of the form the opposition of a section of the Robinson shareholders had taken. Further, they expressed the view that in no case should the Crown Mines increase the price offered for the Robinson assets. In the circumstances your directors decided to accede to the request of the Board of the Robinson Gold Mining Company, and this decision was communicated to you by circular dated the 7th of February last. Notwithstanding the fact that we have no business to submit to this meeting, we were advised that it would have to be held in order to comply with the law. It remains for me to thank you for your attendance.

Besides Mr. Evans there were present Messrs. R. A. W. Schumacher, H. C. Boyd, E. Cullens, E. J. Renaud, S. C. Steil, J. L. Jourdan, M. Honnet, H. Daniel, H. L. Mascall, G. H. Darby, C. Meintjes, H. Thomas, H. J. McCormick, R. Martin, A. G. Gill and F. H. Barry, representing 932,727 shares.

Robinson Adjournment.

The Robinson meeting, as stated, had to be adjourned till next Monday owing to the absence of a quorum. The Chairman, Mr. H. C. Boyd, in announcing the adjournment, said there were represented personally and by attorney 9,025 shares. There were 57,833 proxies in favour of the chairman, but shareholders representing 175 shares in that number had asked the chairman to vote against the proposition. The quorum required was a quarter of the issued capital. Therefore, the necessary quorum was not present, and in terms of the Articles the meeting would have to be adjourned to next Monday at the same place and hour. It would be plain to them, said the chairman, that there would be no business before the meeting; but in view of the form which some of the criticism against the formally proposed scheme had taken the chairman would take the opportunity of making a statement at that meeting.

Mr. B. Alexander: Will any shareholder be allowed to answer your statement?

Mr. Boyd: Certainly.

Among those present at the Robinson meeting besides Mr. H. C. Boyd were Messrs. E. Callens, Comte. F. de Feirries, E. Renaud, J. L. Jourdan, F. H. Barry, B. Alexander, H. Thomas, G. H. Darby, S. C. Steil, H. J. McCormick, F. C. Adams, W. J. Endean, H. A. Reid, R. W. Schumacher, E. M. Hyman (also representing A. Hyman), A. W. Tucker, W. Rosenberg, M. Mindelsohn, S. Evans, M. Honnet, C. Meintjes, N. Richardson, R. Martin, C. Distel, A. J. Wright, C. L. Burke, G. F. Fitzpatrick (representing Julius Friedlander), R. E. Philphott, Lionel Cohen, and in attendance H. L. L. Feltham.

ANGLO-FRENCH COAL ESTATES.

Annual Meeting.

Sound Financial Position.

The annual meeting of the shareholders in the Anglo-French (Transvaal), Navigation Coal Estates, Ltd., was held in the board-room, National Bank Chambers on the 18th inst., Colonel W. Dalrymple presided, and there were present Messrs. W. J. Gau, E. H. Read, C. P. Marais, C. W. Southwood, Gordon Sandilands, J. E. Grieveson, and the secretary, Mr. L. S. Raymond, and Mr. J. W. Austin, transfer secretary. The total share representation, in person and by proxy, was 154,687.

The Chairman's Speech.

The Chairman, in moving the adoption of the reports and accounts, said: You have before you the report of the board, to which is attached that of the general manager and the audited statements of accounts relating to the operations of the company for the year ended the 31st of December, 1913, which I think deal fully with the operations of the company for the period under review. The profit on coal winning amounted to £23,498, and this, together with a balance of £1,553 brought forward from the last account, has been appropriated as follows: £19,500 for dividends Nos. 5, 6 and 7 (totalling 16¼ per cent.) to preference shareholders. £3,000 to provide for extension of plant and depreciation, as required by the articles of association, and £2,551 has been carried forward. Total, £25,051.

Preference Shares.

The unpaid balance on the cumulative dividend on preference shares at the 31st of December, 1913, amounted to £19,930, as against £31,030 at the close of the previous year, showing a reduction of £11,100 in the liability to preference shareholders as a result of the year's work. Thus the hope expressed to you at our last annual meeting that the profits for the year would permit of a further substantial reduction being made on the amount due to preference shareholders, has been fully realised. The output for the year amounted to 302,172 tons of marketable coal, representing an increase of 39,506 tons, as compared with the previous year, and when it is remembered that the year 1912 showed an increase over the year 1911 of 32,974 tons, it will be seen that substantial progress has been made, though the margin between working cost and profit is not commensurate with the value of the undertaking, which, of course, is traceable to the low selling price obtained. The whole of the output has been drawn from the lower seam, and it is gratifying to note that the coal produced from your mine finds a ready market. Considerable expenditure has been incurred in connection with the extension of mining equipment with a view to increasing the output.

Plant and Machinery.

The company's plant and machinery is working very satisfactorily, and a new electrical generating set capable of producing 100-120 kilowatts has been installed, at a cost of £1,050, also a Lancashire boiler, chimney stack, one hundred coal tubs, steam hammer, coal cutter and punching machine, at a further total cost of £2,300. During the year £400 has been voted on additional single quarters, and £500 to provide a recreation hall for the company's white employes. The hours of work for both white and native employes were reduced on the 1st of August to fifty-seven hours per week. Combined efforts have been made by collieries in the district to improve the condition of the native workers, and regulations have been framed in connection with their pay and food.

Bunkering and Export.

The Transvaal Coal Owners' Association, Limited, has made efforts to increase the bunkering and export trade, and, in anticipation of obtaining a share of such increase your directors have sanctioned an expenditure of £6,860 to provide the machinery necessary to handle an in-

increased tonnage. This has been ordered, and should be in full commission before the end of the current year. Two industrial upheavals in the form of strikes have taken place since your last meeting, neither of which seriously affected your company. The first took place between May and July, which, however, did not directly affect the working of your colliery. In January a number of your employees struck work and the strike lasted for three days. The chief loss was occasioned through the inability of the Railway Administration to supply trucks owing to the dislocation of the Railway system caused by the strike. During the year we have suffered through shortage of trucks, but latterly there has been considerable improvement in the service.

Thanks to Staff.

The thanks of your board are due to the management and the staff for the excellent services rendered to the company during the year under review. Messrs. C. L. Andersson and Co. resigned from their position as joint auditors to the company, and the board appointed—subject to your approval—Mr. Samuel Thomson in their stead. Messrs. G. R. Airth and C. R. Pinder resigned their seats on the board during the year, and you will be asked to confirm the appointment of Messrs. E. H. Read and C. P. Marais to fill the vacancies created. I now beg to formally move the adoption of the reports and accounts for the year ended the 31st of December, 1913, and would also ask your confirmation of the action of the directors in declaring during the year interim dividends Nos. 5, 6, and 7 to holders of preference shares.

The report and accounts were adopted unanimously.

The appointments of Messrs. E. H. Read and C. P. Marais as directors in place of Messrs. George R. Airth and C. R. Pinder, resigned, were confirmed. The retiring directors, Messrs. W. Dalrymple, G. W. Higgins, B. Hansford, A. Little, E. H. Read, and C. P. Marais, were re-elected. Mr. Samuel Thomson's appointment as auditor in place of Messrs. C. L. Andersson and Co., resigned, was confirmed.

An amount of £300 was voted to the directors as additional remuneration.

BOOKS RECEIVED.

"The Mining Manual." Walter R. Skinner, London. The Transvaal Leader, Johannesburg.

The 1914 edition of "The Mining Manual" is as comprehensive as ever and fully maintains the reputation of Mr. Walter R. Skinner's volume as the standard reference work on mines. All the mines of the world are dealt with in the twelve hundred odd pages of this book, and not only do all the mineral properties of the globe find mention in regard to officials, date of establishment, technical details, financial details and stock exchange details, but the work constitutes a directory of directors. Complete lists of directors, secretaries, mining and consulting engineers, managers and agents are given. Detailed particulars are to be found of 2,620 companies, but in addition there is an index which contains 5,220 companies. This is of the utmost value, in that active, private or dormant companies can easily be traced. It is interesting to observe that the work is arranged in two sections—African and the Rest of the World, a fact which indicates how numerous and important are the mines of the Dark Continent. This is a book which must find its place into the bookshelves of everyone closely associated with the mining industry. Locally the book is to be obtained from the *Transvaal Leader* offices.

Rietkuil Property.

No mining work was done at the Rietkuil property during the past year. During the period under review, say the directors in their report, the expenditure amounted to £5,928 14s. 9d. As usual, the major portion of this sum was made up of interest on loans and claim licences. The largest shareholders had continued to advance the funds necessary to meet the current expenditure, the company's indebtedness under this head, including interest, being at the 31st December, £83,225 12s. 7d. The company still holds 30,000 reserve shares.

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36. Thomas Pettigrew.—Improvements in selecting devices for telephone and other exchanges.
37. William Herbert Grinsted.—Improved test circuit arrangements for telephone systems.

The National Bank of South Africa, Ltd.

Notice to Shareholders.

NOTICE IS HEREBY GIVEN that the Ordinary General Meeting of Shareholders will be held in the Board-Room of the Bank Buildings, Pretoria, Transvaal, on FRIDAY, the 29th May, 1914, at 12 o'clock Noon, for the following purposes:—

1. To receive and consider the Balance Sheet of the Bank's operations for the period ending 31st March, 1914.
2. To receive the Report of the Directors and Auditors.
3. To confirm the following appointments by the Board of the undermentioned gentlemen as Directors of the Bank:—E. R. Syfret, Esq., Senator the Hon. Dr. A. G. Viljoen, and the Hon. Sir Edgar H. Walton, M.L.A.
4. To elect three Directors in place of Messrs. J. Emyrs Evans, C.M.G., Hon. Hugh Crawford and E. Renaud, who retire in terms of the Trust Deed, but are eligible and offer themselves for re-election.
5. (a) To fix the remuneration of the Auditors for the past audit; and (b) to appoint Auditors for the ensuing year. Mr. Robert Baikie, I.A., and Mr. John Dougall, I.A., the present Auditors, offer themselves for re-election.
6. Transaction of General Business.

The Head Office (South Africa) and the London Share Transfer Registers of the Bank will be closed from the 4th to the 9th May, 1914, both days inclusive, for the purposes of this meeting and for any dividend that may be declared thereat.

Attention is drawn to the following—Holders of Share Warrants to Bearer are entitled to vote by proxy. Such Shareholders desiring to be present or represented at the meeting must deposit their Share Warrants at the places and within the times stated below:—

(a) At the Head Office of the Bank in Pretoria, at least three days before the day fixed for the meeting.
(b) At any of the Branches of the Bank in South Africa, at least eight days before the meeting.
(c) At the London Office of the Bank, Circus Place, London Wall, E.C., at least thirty days before the meeting.
(d) At the Credit Mobilier Francais, 30 and 32, Rue Taitbout, Paris, at least thirty days before the meeting.
(e) At the Deutsche Bank, Berlin, at least thirty days before the meeting.
(f) At the Rotterdamsche Bankvereeniging, Amsterdam, at least thirty days before the meeting.

The instrument appointing a proxy must be deposited at the Office in Pretoria not less than 48 hours before the time fixed for the meeting at which the person named in such instrument purposes to vote.

By Order of the Board of Directors.
C. P. MATHEWS,
Secretary.

Pretoria, 19th March, 1914.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

CONTENTS.

PAGE

Notes and News 81

Topics of the Week:

The Industry Officially Reviewed 83
Progress of the Dust and Anti-Phthisis Campaign 83
The New Problem of Organised Labour 84
The Transport of Ore Underground 85
Mining Men and Matters 86
"Safety-First" Prizes: Important Offer of Valuable Awards for New Ideas and Devices 87
The Wages Bill of South African Mines 88
Progress at the New Kleinfontein 89
Ventilation on the Mines of the Rand 90
The Manager and Staff of the New Unified Main Reef Gold Mining Co., Ltd. 91
Annual Report of the Apex Mines 92
Labour and the Colour Question in South Africa ... 93
Correspondence and Discussion: "The Sakalava Meeting"; "What is Wrong with South African Mining?" 95

Rhodesian Section:

Latest Mining News 97
Rhodesia's Coal Resources 98
Engineering Notes and News 101
The Week in the Sharemarket 104
Finance, Commerce and Industries 105
What the South African Mines Buy 106
Automobile Notes 108
Company Meetings: Robinson G.M. Co. 109

Notes and News.

The Safety First Movement. In another part of this issue we print the conditions under which the valuable prizes offered by the "Safety First" Committee of the Rand Mutual are to be competed for. The prizes, it will be seen, are, with one exception, open to general competition, and the conditions are of the most liberal and encouraging description. The prizes are being offered in connection with the forthcoming annual mining exhibition, promoted by the Chemical, Metallurgical and Mining Society of South Africa, and they will certainly add greatly to the interest and value of that undertaking. The judges, of whom Mr. R. N. Kotzé, the Government Mining Engineer, will be the chief, will be drawn from the leading engineers of the Rand; and the anonymity of the competitors will be strictly maintained till the judging has been completed. As the exhibition does not take place till the end of May, it will be seen that ample time has been given to intending competitors. It is understood that the design for the medals to be presented has been despatched by this mail, and the work will doubtless be completed in time for the exhibition. The Committee is to be congratulated on this evidence of its enterprise and initiative.

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A Distinguished Visitor. Engineers on the Rand had the pleasure and honour this week of entertaining Professor Perry, the distinguished engineering member of the University Commission, now visiting Johannesburg. Professor Perry's name is, of course, a household word in engineering circles, and his visit afforded many old friends and acquaintances an opportunity to welcome to the Rand so distinguished a luminary of the profession. Professor Perry's presence on the Commission is regarded as a guarantee that the scientific and technical side of its investigations will be given the weighty consideration which is their due.

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"The Nation" Again. Mr. H. W. Massingham's weekly organ of Liberal light and leading, yclept "The Nation," has again been distinguishing itself by outrageous attacks on the Rand. "An Oxford Graduate," resident on the Rand, writing in a recent issue, describes the events of July and January last in a strain of hysterical denunciation that would do credit to a Hyde Park orator of the deepest anti-everything dye. According to this genial critic, the Union Government is weak and cowardly, the very thing which, if anything, it is not. The mining people are, of course, pictured as desperate criminals, knowing no god save Mammon; and—worst of all—the Press is condemned as everything that is vile and unholy. That one Oxford man in our midst should be found to father such nonsense is not, after all, so very surprising—our own Mr. Bunting, of Bezuidenhout, can, on occasion, out-Blatchford them all—but that a responsible organ of public opinion can give prominence to such tosh passeth understanding. Unfortunately, it is by no means the first calumny on the Rand perpetrated in the name of Liberalism by the smug organ of the mild-mannered Mr. Massingham, and there is some consolation in the reflection that his own readers must be, by now, nauseated by such stuff. Nobody ever could be quite so bad as *The Nation* makes us all out to be.

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Austrian Cheap Labour and Advice. The London Labour paper, the *Daily Citizen*, has got hold of another stick with which to chastise the Rand. Some weeks ago we commented on an extraordinary warning alleged to have been issued by the Austrian Government to dissuade workmen from coming to the Rand. In that warning the Rand was pictured as a sort of mixture of Upton Sinclair's "Jungle," Dante's "Inferno," the "Black Hole" of Calcutta, and modern Mexico in miniature. Who is responsible for the cheery libel on the industry we do not know; neither can we trace any overwhelming new-found desire of the fiendish Rand "mine-owners" to entrap more gentle Austrians for deadly and dirty work on the Rand. But the Labour Press is not to be baulked of its "scoop"—an independent condemnation by the Austrian Government of the Rand, and a réchauffé of the whole thing is cabled out for our due delectation and humiliation. If they only knew how sick we were of the alleged Austrian blundering agglomeration of half-truths and misstatements, they would spare themselves the trouble and expense.

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The Kleinfontein-Apex-Benoni Fusion.

At special meetings of the New Kleinfontein, Apex and Benoni Gold Mining Companies, held at the end of last week, it was decided that the New Kleinfontein Company's capital should be increased by the creation of 181,540 new £1 shares, from £970,000 to £1,151,540, and that concurrently the New Kleinfontein Company should take over the entire undertaking of the Benoni Consolidated and the gold section of the Apex Mines. Col. Dalrymple presided at these meetings and gave exhaustive reviews of the positions in regard to finance, development and equipment of the three contributory companies. The provisional offers made by the Board of the New Kleinfontein Company to the Apex and Benoni Companies were that the Apex for its 1,115 reef-bearing claims, together with equipment, etc., be paid 150,000 New Kleinfontein fully-paid shares, and that 31,540 shares be paid to the Benoni Consolidated for its 300 claims and equipment, the New Kleinfontein assuming the Benoni Company's liabilities of £219,000. The intention of the Board is to dewater the Benoni Mine and to make the adjustments, alterations and additions to the Benoni metallurgical plant necessary to render it effective and to increase its capacity from 20,000 tons to 25,000 tons per month. By this means the milling capacity of the New Kleinfontein will be increased to 75,000 tons per month, whilst the consulting engineer recommends that there should at a later date be further extension to 100,000 tons monthly capacity. In regard to the Apex it was pointed out that £750,000 additional capital would be required if that property was worked as a separate unit and "the difficulty of raising this large sum appeared to your board to be insuperable." There was no discussion at the New Kleinfontein meeting, but criticism was forthcoming at the meetings of the Apex and Benoni Companies. At the Apex meeting Sir George Farrar spoke as a large shareholder in favour of the scheme.

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Position at the West Rand Consolidated.

At the West Rand Consolidated the scheme outlined some time ago for increasing the equipment has been well borne in mind, and, despite the difficulties with which the past few months have been fraught, development operations have been actively pushed ahead with a view to preparing the mine for the larger equipment which is to be installed there. Apart from the question of development, it is particularly gratifying to note that although the tonnage milled last year was about 13,000 tons less than in 1912, the profit, as disclosed by monthly statistics, is about £18,000 better. Working expenditure in each year was approximately the same, but there was a substantial improvement in the grade last year, from 27s. 3d. to 28s. 6d. per ton.

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A New Colliery.

The Clydesdale (Transvaal) Collieries, Ltd., propose erecting a coal screening and picking plant for the Clydesdale (Witbank) Colliery, Blackhill Station, in the Middelburg-Witbank coal area. The Clydesdale Company was originally formed to acquire a portion of the freehold farm Daggafontein, in the Springs neighbourhood. This property is still being worked, but is approaching exhaustion, the life being estimated at three years from September, 1913. The Coalbrook property, in the Heilbron district of the Orange Free State, was acquired in March, 1901, and of recent years this has been the main productive asset of the company. The acquisition of the Witbank property and the decision to equip this and bring it to an early productive stage indicates further enterprise on the part of the Clydesdale board. Despite the low price still obtaining for Transvaal coal, there appears to be no lack of activity in the direction of bringing other pits into the arena of competition.

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Mr. Hyman's Proxies.

At a special meeting of the Robinson Gold Mining Company in the Corner House on Monday, Mr. Boyd presiding, the proposed Robinson-Crown Mines amalgamation scheme was discussed, and the Chairman dealt with the objections to the abandoned project raised by shareholders. After Mr. Boyd had concluded his speech—fully reported elsewhere in this issue—there was some discussion and questioning by Messrs. Lionel Cohen and Hyman. The Chairman stated that only 187 shares had been lodged against the scheme, and on Mr. Hyman remarking "I can tell you we have nearly 100,000 proxies against the scheme," Mr. Schumacher very naturally remarked "We should like to have seen them." It seems strange to us that Mr. Hyman did not see fit to arm himself with such formidable weapons of opposition before coming to the meeting. However, the scheme has now been abandoned, although Mr. Boyd, in his address, put forward some very strong arguments in favour of the absorption of the old Robinson by its youthful neighbour.

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A Suggestion from Rhodesia.

Mr. P. B. S. Wrey made a suggestion at the annual meeting of the Rhodesia Chamber of Mines, held in Bulawayo the other day, which might, we think, well be considered in relation to Transvaal as well as Charterland mining. The President of the northern counterpart of our own "Chamber" threw out the suggestion that much good would result from the holding of annual mining congresses, at which all connected with the industry might foregather and discuss matters affecting their interests. In Rhodesia the workers of minerals are scattered over a vast extent of territory, and it is impossible to constitute a central organisation convenient to these widespread localities, such as is secured in Johannesburg by the Transvaal Chamber of Mines. Thus there is a Chamber of Mines in Salisbury, as well as in Bulawayo, and there are small workers' associations in other mining centres. The Transvaal Chamber of Mines admirably represents the Rand and in a lesser degree some of the more important "outside" enterprises. But it does not represent all the spheres of mining activity in this Province, neither does it stand for all classes of mine-owners and workers. Might not a congress, at which the tributor of a gold mine in the Northern Transvaal, the heads of the tin and copper industries, the larger diamond mine and alluvial operators, and the leaders of the Rand would foregather, result in a broader treatment of all questions? And would not the expressed opinions of this aggregate of those directly concerned with mining make a very strong show of force in connection with any petitions to Government for support or redress? We think they would. Such a congress need not in any way compete with the existing Chamber. On the contrary, it should be complementary to that body in a very useful way, and for this reason we think the suggestion thrown out by Mr. Wrey at the Rhodesian Chamber of Mines meeting in Bulawayo is worthy of consideration.

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Significant Testimony.

There is no greater enthusiast on mine safety and the interest of the miners than Mr. E. W. Parker, statistician of the United States Geological Survey. When he discusses conditions between employer and employed he makes no statement not in accordance with fact. His statement that Pennsylvania is the best organised State in the Union so far as mine labour is concerned, but at the same time the State in which there is most labour trouble, is a matter for consideration. Every biennial agreement period there is trouble, resulting in long periods of idleness and loss of income to both employers and employees. The average idle time due to labour troubles is 13 per cent. of the total time made.

TOPICS OF THE WEEK.

THE INDUSTRY OFFICIALLY REVIEWED

The valedictory address delivered by Mr. John Munro as retiring President of the Chamber of Mines, last Monday, very faithfully and concisely reflects a stirring and trying industrial period. The year was chiefly distinguishable from its predecessors by the appearance of new phases of health and labour questions demanding attention or the recrudescence of these perennial problems of the industry in more clamant and aggravated form. These matters naturally bulked largest in Mr. Munro's remarks, and we deal with them separately elsewhere. In other respects the speech followed closely the traditional method of setting forth the industrial progress of the year as mirrored in statistics of profits and production, and the wide sphere of the Chamber's interest was indicated by the inclusion of coal, diamonds and base metals in the President's purview. Of technical progress on the Rand itself, Mr. Munro had not a very great deal to say, but what he said was very much to the point. He admitted that though the year 1913 had in many respects been a trying one, it had not been without its redeeming features. One of the most marked of these had been the noticeable tendency towards greater efficiency in underground work. He mentioned that the transport of ore underground had received considerable attention, and on several of the mines there had been a notable improvement in this work. The tendency now on many of the mines was to go in for heavier tracks and bigger trucks, and to pay more attention to the upkeep of this plant than had been the case hitherto. The severe shortage of native labour which set in in August helped to emphasise what had been apparent for a long time—namely, the very indifferent results which were being obtained from machine work. With a view to increased efficiency, the rates of pay for natives employed on machines had been revised, and a system of payment by results introduced. As this method of paying hammer boys had been quite successful, it was hoped that it would have an equally beneficial effect with machine boys. Mr. Munro added that there was a considerable development in the latter half of the year in the use of small water-fed hammer drills for stoping. The principal advantage in the employment of these drills was that they enabled the stopes to be carried horizontally along the strike of the reef, which tended to lower the cost of handling the broken rock. "This, combined with the high efficiency of the machines employed," he concluded, "holds out considerable hope of a big improvement in underground work. The successful employment of drills of this type will not only lessen the demand for native labour, but will effect a big reduction in underground working costs. It will be seen from the various points which I have referred to that the outlook at the present time is most promising, and that an all-round reduction in costs is within measurable distance of accomplishment." This reassuring statement of Mr. Munro was endorsed by Mr. R. W. Schumacher, who laid emphasis on the importance of the advent of a suitable small water-fed hammer drill. Whether the epithet "small" is strictly justifiable in regard to the drills in question is a moot point in view of the weight of these machines. Certainly they are not small in the sense that the "Gordon" drill of pioneer memory was small, though that fact does little to limit the sphere of their potential usefulness. The great thing, of course, is that a reduction of working costs is now authoritatively stated to be within measurable distance of accomplishment. Apparently this reduction is to be the product of closer study of underground economics, independent of any radical departure from the present industrial policy in regard to colour, and despite the big expenditure incurred in the interests of improved health conditions. Not that Mr. Munro ignored either of these important considerations. The existing "colour bar" on the mines he traced to the *fons et origo mali* in the Mines, Works and Machinery Regulations of the Mines Department, which, he claimed, the Chamber had consistently maintained were unreasonable and probably *ultra vires*. This is, of course, excellent plain speaking as far as it goes—the only pity is the Chamber shows itself lacking in the courage of its convictions by not taking active steps to test the legality of the position created by the Regulations. It may be that recent statements by Ministers in the House of Assembly have given ground for the belief that the Government itself will rectify the anomaly and thereby relieve the Chamber from the necessity of moving in the matter. Indeed this trust in the good sense of the Government was a welcome feature of Mr. Munro's speech; and Mr. Schumacher, in dealing with the improvement of health conditions on the mines, very forcibly echoed it. "In this matter and many other matters," he said, "it will, of course, be desirable for us to act absolutely hand in hand with the Government from the highest Minister to the youngest inspector. I think you will all agree the more friendly our relations are with the Government the more easy it will be to effect improvements in other directions." Doubtless the leaders of the industry have good and sufficient reasons to warrant these expressions of confidence in the willingness and ability of the Government to co-operate in all matters affecting the welfare of the mines. After all, little is to be gained by a policy of nagging; and Union Ministers have lately shown a praiseworthy anxiety to settle permanently some of the more pressing labour problems of the industry. The policy of the industry, as revealed by these statements, to our mind, is sound and in the very best interests of the Rand. Concentrating themselves upon the perfecting of the industry from within by increasing attention to efficiency and economy, the leaders of the Rand are apparently content to credit the Government with the best intentions. These, when the present pressure of legislation is past, it will translate into the measures and reforms needful to the realisation of the Rand's fullest possibilities. That appears to be the chief lesson learned by the Chamber of Mines in "a trying year," and it is certainly one of comfort, confidence and good cheer for the future of the industry.

PROGRESS OF THE DUST AND ANTI-PHTHISIS CAMPAIGN.

According to advices from our Parliamentary friends at Capetown, the Select Committee now engaged on the revision of the Phthisis Act is making good progress. Expert witnesses from the Rand have given evidence, and the lessons of the first eighteen months working of the measure are being turned to account. One conclusion in regard to the matter, gleaned from Mr. Munro's speech at the Chamber of Mines, is that a definition of the term "miner" has now been reached satisfactory to all parties. It is freely rumoured also that it is the intention of the Select Committee to recommend the increase of the present sum payable to sufferers in the first stage of miners' phthisis. Moreover, precautionary measures to check deception on the medical examiners are likely to be introduced. Here on the Rand the campaign against the evil goes steadily on. Naturally a considerable portion of the valedictory address of the President of the Chamber of Mines was devoted to the subject, and not a few important facts were brought out. Speaking generally, Mr. Munro stated that the health conditions on the mines, both underground and on the surface, never received more enthusiastic attention than to-day, and the members of the Chamber were determined to spare neither effort nor money to make them as perfect as possible. There was no doubt, he said, that a great improvement had been effected underground. The Miners' Phthisis Prevention Committee had been unremitting in its efforts, and had carried out an immense number of tests and experiments with various appliances for laying dust. On the mines every effort had been made to enforce the Government Regulations dealing with this matter, and a large percentage of the mines along the Reef had installed a system of artificial ventilation, whereby by means of powerful fans the foul air and gasses in the underground workings were drawn out, and the air currents so regulated and directed that the miners were kept clear of the smoke and dust during blasting time. Of course this had entailed considerable expense to the mining companies, and had absorbed profits which under ordinary circumstances would have been available for distribution to shareholders. We agree with Mr. Munro that no one will grudge the expense which has been incurred, provided that the object in view is attained, viz., to make the conditions of work underground as healthy as they are on the surface. In this connection it is most satisfactory to note that both the underground officials and the miners themselves are paying much greater attention to the laying of the dust in the mines, and with everyone working to the same end the danger of contracting miners' phthisis is rapidly decreasing. It is too early yet to expect that the return of the Miners' Phthisis Compensation Board will reflect to any great extent the improvement which has taken place, but that a notable improvement has been accomplished there is every reason to believe. The Miners' Phthisis Prevention Committee is at present engaged in investigating the condition of every mine on the Rand with regard to dust. The results of their investigations will be looked forward to with interest by all concerned. The question of the danger of tubercular infection on the mines, which has such an important bearing on miners' phthisis—a point emphasised by Colonel Gorgas—is receiving careful attention. Mr. Munro added: "The Miners' Phthisis Sanatorium is being taken advantage of to an increasing extent by men affected by miners' phthisis. I am glad to say that the Medical Superintendent of the Institution is of opinion that many early cases of silicosis uncomplicated by tuberculosis appear in the light of recent investigations to be curable, while more advanced cases are frequently capable of marked improvements. The fact, however, that tuberculosis and silicosis combined are a most fatal combination, renders it imperative for all possible steps to be taken not only to remove from the mines the causes of silicosis, but also to attack the sources of tubercular infection." The humanitarian and economic importance of all this work would be impossible to over-estimate. Nothing, indeed, of greater consequence has engaged the attention of the industry since its start, and it is not too much to say that the success of the present movement will vitally affect the whole future of the Rand. For this reason, therefore, the hopeful statement made by Mr. Munro and the good news from Capetown in regard to the improvement of the Phthisis Act, may be regarded as two of the brightest features of the week.

THE NEW PROBLEM OF ORGANISED LABOUR.

Deeply interesting and significant to students of modern political economy was the discussion that took place at the Chamber of Mines annual meeting this week on the subject of organised labour. To Sir George Albu is due the credit for boldly attacking this new phenomenon of industry in this country, and he succeeded in "drawing" Mr. Schumacher, Mr. Dawe and Mr. Boyd into making very important pronouncements. If we interpret Sir George Albu aright, he is all for crushing militant trade unionism in its comparative infancy in this industry, and he is out for a straight fight against forces which he thinks mean no good to the industry. All this, it is only fair to him to add, is merely deduced from his general attitude, and may, perhaps, not exactly summarise his views. The majority of the other leaders of the industry adopt a much less combative attitude, and in their speeches on Monday clearly indicated that they were disposed to give Labour a chance, "to wait and see," in a word to make the best of the situation. That this is the official view of the Chamber of Mines is shown by the fact that the outgoing President announced that they were willing to recognise trade unions, provided their privileges and obligations were defined by Act of Parliament. The interest of the discussion lies in the fact that the differences of opinion displayed, though to many they appear to be of a mere academic nature, to our mind typify two important and representative schools of thought. That of Sir George Albu represents the German school of employers, that of his opponents the British, and as everyone who has followed Labour developments in Great Britain and Germany in recent years knows, there is a wide fundamental difference between the two. For the best and briefest description of the German employers' attitude towards trades unions we have to go to a recent work entitled "Industrial Germany," by Mr. W. R. Dawson, which has many lessons of value to South Africa. In that work it is shown that the German employer still refuses to have any truck with the trades unions:—

> "Nothing in the history of German industrial organisation is more remarkable than the way in which during the last ten years the employers have rallied together for the purpose of resisting the steadily increasing pressure of organised labour. What is specially noteworthy about this counter-movement is the fact that the weapons adopted have with hardly a single exception been borrowed—sometimes with improvements—from the enemy's armoury. Thus the modern employers' federation is the counterpart of the great trade union agglomerations; the Central Office (Hauptstelle) of these federations corresponds to the central Trades Council of the labour organisations; the collective lockout was the employers' answer to the collective strike, the sympathetic lockout to the sympathetic strike, the strike insurance fund to the trade union strike pay, the employers' labour registry to the trade union registry, the employers' information and advice agency to the workmen's secretariat, the employers' black list to the trade union boycott, and so on."
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> "Concerted action would imply the recognition by the employers of the labour organisations, and such recognition the employers are not prepared to give. Here is the kernel of the whole labour difficulty in Germany so far as the employers are concerned. It is not a question of wages or other conditions of employment, but of the claim of the trade unions to negotiate with the employers and their organisations on equal terms. The employers refuse to negotiate with the unions at all, and insist that no intermediary shall come between them and their work-people In the words of one of the best known literary spokesmen of industry, 'Since employers alone create work they alone have a right to dispose of it as they will.' What the leaders of the large industries in particular want and aim at, is the repression of trade unionism as a fighting force. Not only so, but many of their number believe that they are on the way to success. Hence the enormous expenditure which is being incurred in efforts of many kinds intended to counteract and paralyse labour organisation—in the maintenance of their own associations, labour registries, and advice agencies, in the subsidising of the 'Yellow' organisations of work-people, in the support of voluntary benefit funds and benefactions of all kinds, the offer of bonuses and premiums for good service, and so forth. To the English observer the German employer may appear to be engaged in a struggle with forces and tendencies beyond his power to control. He does not believe this, however, and the strenuous fight he is making in the full conviction that victory will be on the side of his big battalions is, perhaps, the most interesting incident in German industrial life at the present time."

It is instructive to compare the attitude of the British school of thought, the influence of which we see in the Chamber of Mines. Mr. Schumacher has been making a personal examination of labour conditions in British industries, and plainly he inclines to the adoption of the British employers' views. Mr. Dawe, in the moderate, conciliatory and statesmanlike speech made at the Chamber, clearly takes the same line, and he gives good sound reasons for the faith that is in him. It is as different from Sir George Albu's attitude as the typical British employers' is from that of the German. Let it be clearly understood that we do not claim to be able to decide, offhand, with which policy wisdom lies. Conditions in this country are unique. Time alone can prove who is right. It is enough here to indicate the importance and far-reaching nature of the issues under discussion. At any rate, the Chamber of Mines has the experience of employers in these older countries to study and apply. As a result, it may be that the ideals of neither school of thought may prove most adaptable to this country. A middle course may be best.

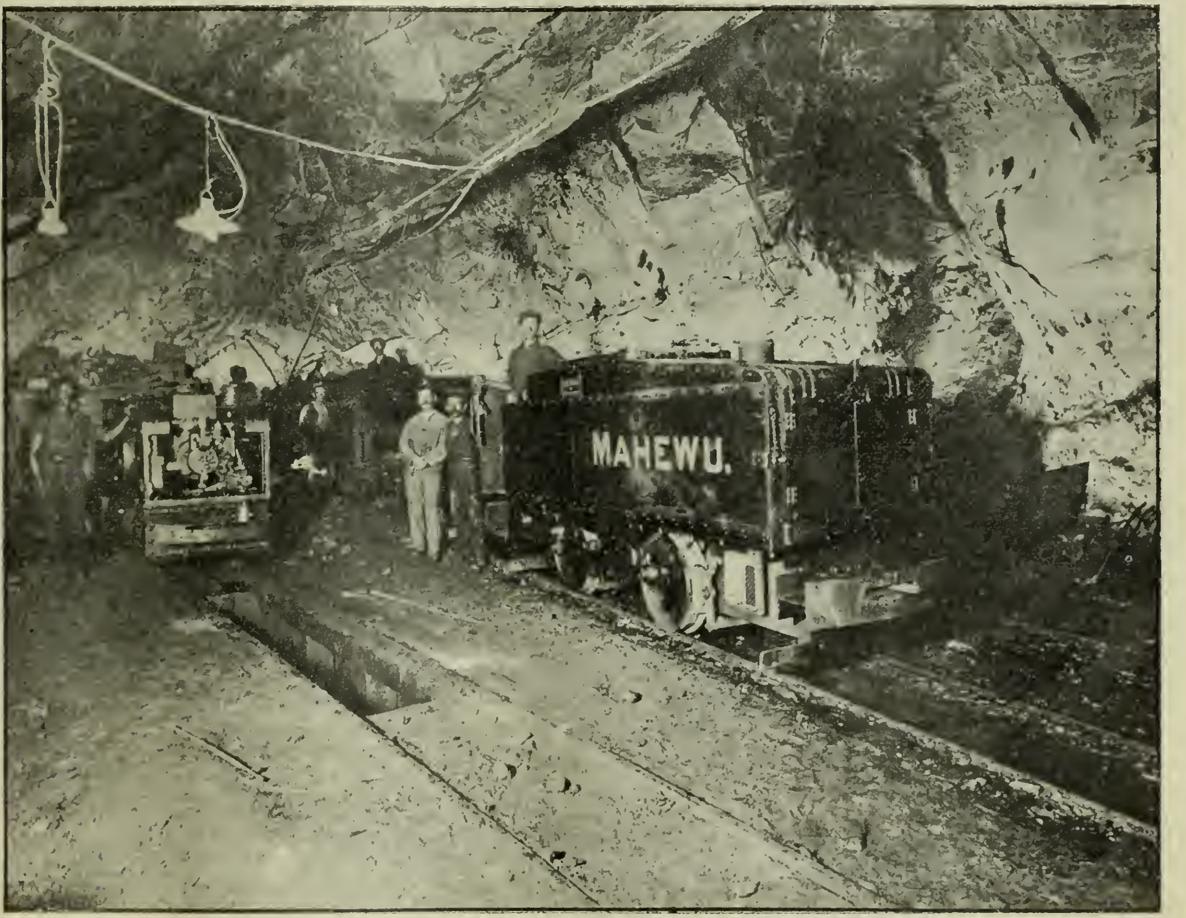
Northern Transvaal Copper.

Despite the pronounced success of the Messina Company and the large known extent of the cupriferous deposits of the extreme Northern Transvaal but little work is proceeding in this highly mineralised portion of the Province, apart from the Messina Company's operations on Berkenrode. A little prospecting work is now being carried out on the farm Vryheid and results are promising, but on Artonvilla and other properties notwithstanding most encouraging prospects nothing is being done. In addition to the mineralised areas immediately adjoining the Messina Mine there are other extensive cupriferous deposits in other parts of the extreme Northern Transvaal—notably at Motale, M'Tamba, Palabora, and the Malgo Syndicate's ground, and these will doubtless soon again attract attention.

THE TRANSPORT OF ORE UNDERGROUND.

Importance of the Subject—Methods of Locomotion—The Question of Costs—The Value of Main Haulage Levels.

Mr. John Munro, the retiring President of the Chamber of Mines, concerned himself mainly with labour conditions, health problems and legislation affecting the mining industry in his speech at the annual meeting of that institution on Monday last. In Mr. Munro's address there was markedly little in regard to technical practice, but this omission is easy to understand, for other matters have bulked much larger in the Chamber's view during recent months. There was, however, one statement relating to mining practice to which, we think, attention may well be directed, and that was Mr. Munro's reference to the handling of ore in the mines. "The transport of ore underground has received considerable attention, and on several of the mines there has been a notable improvement in this work," remarked Mr. Munro, and, continuing, he said: "The tendency now on many of the mines is to go in for heavier tracks and bigger trucks and to pay more attention to the upkeep of this plant than has been the case hitherto."



Transport on the 13th Level, West Section, Crown Mines.
Flashlight Photo by G. A. Watson.

A Redeeming Feature.

As the President remarked, 1913 was in many respects a trying year, although it has not been without redeeming features. Certainly one of the most prominent of these features has been the greater attention bestowed on underground ore transport. Up till a few years ago it must have been abundantly evident to anyone who took the trouble to go underground and investigate methods of mining practice that a tremendous amount of time and labour and money was wasted in tramming. Trucks off the rails, spilled ore blocking levels, natives straining at mine cars that had left the line, workmen continually hammering at tracks; these were common everyday (in fact one might truthfully write every hour) scenes. Latterly there has been a tendency observable almost right along the Reef to instal heavier rails and at the same time to employ more substantial mining trucks with larger carrying capacities. Generally speaking, the disposition has been to increase the weight of rails more than the cars themselves, and one would therefore expect to find much less delay and waste through the wagons leaving the rails. As a fact, conditions in this regard are very much better than they were a few years ago, and it is therefore somewhat disappointing to ascertain that during the past three years there has been little, if any, indication of a decline in the underground ore transport charges.

The Question of Costs.

Indeed the experience of one of the leading groups of the Rand is that there has been no reduction at all in lashing and tramming charges since 1911. It should here be explained that unless it is specially desired to investigate the exact cost of some particular branch of ore lashing and tramming underground these two operations are in the cost sheet considered as one. At the mines of the group under consideration the costs for "lashing," shovelling and tramming vary from about 1s. 5d. to 3s. per ton handled, according to the different conditions obtaining in the different mines. In the last three years, although many improvements have been effected in regard to ore handling methods, there has been no diminution of cost, and the obvious explanation is that the economy resulting from better practice has been absorbed by the burden of extraneous expenditure. There is, of course, plenty of scope for economy in regard to this department of mining on the Witwatersrand, as indeed there is scope for economy in every branch, and under more favourable conditions charges in connection with ore handling should be substantially reduced.

Main Haulages.

The driving of main haulage levels and concentration of underground transport operations is an important factor in securing better underground ore transport conditions. At a number of the larger mines of the Witwatersrand these main haulage levels are being driven right across the properties in question along the strike of the reef from one boundary to another. To cite a few instances of mines possessed of these main haulage levels, we may refer to a few subsidiaries of the Central Mining and Investment Corporation. The Crown Mines has, for instance, the 13th level driven across a considerable section of that property and equipped with electric locomotives. Below this, the 16th has also been laid out as a main haulage level. The Village Deep, City Deep and Modderfontein B., amongst other companies, have also well-equipped main haulage drives. Main haulage levels are, of course, not practicable or economical in all mines. Where the width of the property from east to west is markedly small, or where the dip is very steep, main haulage drives would have very little to be said in their favour. The value of levels of this nature depends on the extent of operations and the quantity of ore that can be concentrated on them. The life of the mine which it is proposed to equip in this manner is obviously another material consideration.

Methods of Transport.

It is interesting to note the various methods of ore transport underground as practised on the Main Reef series. We need not discuss hand tramming, which naturally obtains along levels not specially widened and equipped as main haulages.

The Crown Mines Scheme.

One of the most modern underground ore transport equipments in the world is that possessed by the Crown Mines Company on the 13th level. This level will eventually be about three miles in length, and it is 14½ feet in width and 9 feet high. The permanent way is laid with 45lb. flat bottom rails. Twelve-ton trucks, with a maximum of eight in a train, are used for the conveyance of the ore. The employment of these large capacity trucks has proved thus far an unqualified success. Their adoption and the method of running have resulted in a large saving of time and labour in loading and discharging, and in maintenance charges which would have been incurred had small side-tipping trucks or fixed well-bottom trucks been used. The trucks have a capacity of 12 tons each, or slightly more when well filled, and are of novel design, being of the side discharge saddle type, mounted on four-wheel bogies, with buffer draw-bar attached to the bogie frame, instead of to the main truck body frame as usual. The trucks are run in trains of eight (maximum), drawn by 100 h.p. electric mining locomotives at a speed of 10 miles per hour. These locomotives weigh eight tons each and carry two motors, which may be run in series or in multiple, thus giving two speeds without resistance losses. They are capable of exerting a draw-bar pull of 3,200 lbs. at a speed of 10 miles per hour. The current for the locomotives is furnished by two motor generator sets, each consisting of 250 k.w. 500-volt compound-wound generator direct coupled to a 2,000 volt motor. These sets are located in the pump chamber at the 13th level, and will ultimately furnish current for the 16th and 19th main levels, in addition to that now used on the 13th level.

Other Means of Locomotion.

In the western section of this great property petrol locomotion is employed. On the first level drive of the Langlaagte Deep locomotives of 16-25 h.p. are installed. These pull 30 tons per trip in 3-ton saddleback trucks. Other methods of mechanical transport in use are endless rope and tail-rope haulages. Animal transport is employed on the City Deep, and at the Modderfontein B. both animal and tail-rope haulages are in use. The foregoing will serve briefly to show how much heed is to-day being given on the Witwatersrand to a branch of mining work which in the past was largely neglected. One is certainly justified in looking for some reduction in working expenses in this direction in the near future.

MINING MEN AND MATTERS.

Mr. E. L. R. Kelsey, secretary of the Chamber of Mines, left this week on a six months' holiday in Europe.

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Mr. W. J. Gan has been elected to the Executive of the Chamber of Mines, in place of Mr. G. W. Higgins, as representative of Farrar interests.

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Mr. James Whitehouse, manager of the Village Deep, left on Thursday for a well-deserved holiday in Europe. His place at the Village Deep is being filled by Mr. E. F. V Wells.

* * * *

Mr. J. P. Johnson, formerly of the Rand, and author of "The Mineral Industry of Rhodesia," etc., and now settled as an orchardist in the Tamar Valley, Tasmania, is paying a brief visit to Johannesburg, and is staying at the Grand National Hotel.

* * * *

Speaking at a Kimberley banquet to the Dominion Commissioners this week, Sir Edgar Vincent, Chairman of the Commission, said: They were not talking Commission; they came to learn what they could, and, therefore, it behoved them to listen and not to talk. He thought the Commission could adopt a very suitable motto which he saw in Kimberley, which, translated, read: "Listen, see, hold your tongue."

* * * *

Congratulations to Mr. E. A. Wallers on being elected President of the Chamber of Mines this week—the highest honour in the gift of the industry. Likewise to Messrs. W. H. Dawe and W. L. Honnold on being elected Vice-Presidents. Mr. S. C. Black has retired from the Executive of the Chamber. Mr. R. W. Schumacher paid a graceful tribute to his services at the annual meeting on Monday. In Mr. S. Evans the Executive has a new member of keen progressive tendencies.

Referring to Mr. Tom Mann's recent suggestion in America that by refusing to act as "wealth producers" the workers would starve out the Government, the Boston *Commercial* properly asks, how the "wealth producers" are to be fed, clothed and provided with light and transportation while they are starving out the rest of the world? Our contemporary adds: "Only when labour desires to co-operate with capital and desists from attacking it, will capital be forced by public sentiment to co-operate with labour."

"SAFETY-FIRST" PRIZES: IMPORTANT OFFER OF VALUABLE AWARDS FOR NEW IDEAS AND DEVICES.

Full Official Details of the Conditions of the Competition.

The following is the list of prizes to be presented by the "Safety First" Committee of the Rand Mutual Assurance Co., Ltd., at the forthcoming Mining Exhibiton on the 29th May:—

"Safety First" Exhibits.

Class A.—1st prize, £25 cash and silver medal; 2nd prize, £15 cash and bronze medal; 3rd prize, £10 cash, for the three best exhibits of a safety device, appliance or method of procedure. Exhibits must be the *bona fide* invention or idea of the exhibitor or exhibitors, and must be accompanied by a declaration to that effect. Entrance free. Open, except to purely mercantile firms, or agents who are interested in the sale of the article exhibited.

Class B.—1st prize, silver medal; 2nd prize, bronze medal, for the best two exhibits of safety devices or appliances. Entrance free. Open to all mercantile firms or agents, who are prepared to supply the devices exhibited.

It is notified that exhibits in Classes A. and B. must be of practical value for the purpose of preventing accidents to workers or minimising the effects of such accidents in or on mines, and must be such as have not hitherto been in general use.

Class C.—1st prize, £10, for the best exhibit of an enclosed lamp, suitable for use in metalliferous mines, by miners, whilst handling explosives. Cheapness and simplicity of construction will be material considerations. The above prizes are given by the Prevention of Accidents Committee of the Rand Mutual Assurance Co., Ltd., and are subject to the following conditions:—

Conditions.

1. Entries close on Saturday, 9th May. Entrance forms are obtainable on application to Mr. Fred Rowland, secretary. Exhibits must be delivered at the Volunteer Drill Hall, Twist Street, Johannesburg, not later than Saturday, 16th May, and must remain until the close of the Exhibition on the 29th May. Exhibits remain the property of the exhibitors, and must be removed from the Drill Hall by 5 p.m. Saturday, 30th May, at the latest.

2. Exhibits of devices must be either the full-sized working appliance, model or such drawings, plans or photographs from which the full-sized working appliance is capable of being constructed, and must be accompanied by such specifications and prices of materials as will show the total cost of the finished article, or, in the case of exhibits by firms or agents, the local selling price must be given. Exhibits may be accompanied by concise statements as to their efficiency and use in working.

3. Exhibitors shall attach a label to every exhibit, which shall clearly explain its nature, objects and name of the exhibitor (cards for this purpose may be obtained on application to the secretary).

4. *Special condition applicable only to methods of procedure.*—These exhibits must relate to new methods of procedure, which do not necessitate new appliances, and must be described on not more than five foolscap pages of typewriting, accompanied by such charts or plans as are necessary to fully explain the exhibit. The approximate cost of working such procedure must be given, and, naturally, economy in working will be a material consideration in judging such exhibits.

5. The Committee of the Rand Mutual Assurance Co., Ltd., reserves to itself the right to reduce the number or amount of, or to withdraw any or all, prizes if, in the opinion of the Judging Committee, insufficient or inadequate exhibits are made.

The Judges.

Mr. R. N. Kotzé, Government Mining Engineer, has kindly consented to act as Chairman of the Judging Committee. Other judges will be drawn from the ranks of the technical leaders of the industry.

Further general conditions will be found in the prospectus of the Exhibition. These relate to space required, insurance of exhibits against fire, responsibility for theft or damage, electric light and power required.

Full particulars are obtainable from Mr. Fred. Rowland, F.C.I.S., Secretary. Office: 9 S.A. School of Mines and Technology Building, Eloff Street, Johannesburg. P.O. Box 1183, Telephone 1404. The office will be open every Saturday, prior to the Exhibition, from 10 a.m. to 5 p.m. for the benefit of exhibitors wishing to see the secretary personally.

Welfare Work on Rand Mines.

The Modderfontein B. New Recreation Hall.

THE WAGES BILL OF SOUTH AFRICAN MINES.

Last Year's Payments: Whites, £9,913,490; Coloured, £8,027,541—Rates of Pay on the Witwatersrand—White and Native Labour Ratios.

ACCOMPANYING the statistics issued by the Union Department of Mines for the month of December is one of the tables periodically compiled by that branch of the Civil Service relating to the salaries and wages of white employees in and on the mines of the Union. The figures are at this juncture of more than ordinary interest. The wages of the Rand's white workers and the conditions of labour generally have bulked very large in the public view of late, and as December was the month before the last industrial upheaval, it will be worth while instituting a brief enquiry into the rates of pay for certain branches of work in and on the mines. On July 5th of last year, the day of the previous disturbances, we published a table giving the cost of wages paid to workers on Rand gold mines, as disclosed by the last available report of the Government Mines Department. For purposes of comparison we give these in parallel column with the wages paid per shift for the month of December, 1913. The figures for the two periods are for some of the more important branches of mining work as follows:—

	1913. *Per day.* s. d.		1912. *Per day.* s. d.
Machine stoping:			
Contract	28 11	......	28 8
Day's pay	20 0	......	22 3
Hand stoping:			
Contract	27 8	......	26 11
Day's pay	19 3	......	19 6
Machine developing:			
Contract	36 6	......	35 4
Day's pay	18 3	......	20 2
Hand developing:			
Contract	30 4	......	27 6
Day's pay	19 4	......	19 0
Shaft sinking:			
Contract	49 5	......	50 5
Day's pay	23 10	......	25 0
Other miners (such as waste packers, etc.)	13 4	......	13 3

Payments to fitters, engine drivers, etc., are also worth noting:—

	1913. *Per day* s. d.		1912. *Per day.* s. d.
Fitters	21 5	......	20 2
Machinists and turners	19 11	......	20 6
Riggers, rope and wire splicers	21 1	......	20 6
Boilersmiths	20 0	......	20 2
Plumbers	19 9	......	20 2
Smiths	20 1	......	20 2
Drill sharpeners:			
Contract	22 9	......	26 6
Day's pay	20 6	......	21 3
Carpenters	22 0	......	20 0
Masons and bricklayers	20 2	......	20 2

For men employed on reduction and treatment plants official figures as to their wages are:—

	1913. *Per day.* s. d.		1912. *Per day.* s. d.
Amalgamators	17 11	......	18 4
Assistant amalgamators	13 7	......	13 5
Millwrights	20 7	......	20 8
Cyaniders	17 0	......	16 9
Slimesmen	11 6	......	14 4

It will be noted that between these two periods there is no material average decline. Rates are higher in the cases of some trades and lower in the cases of others. In the whole of the Union the salaries paid out to white employees by mining companies last year amounted to £9,913,490. Of this amount the Transvaal was responsible for the payment of £8,551,921, the Cape £868,982, the Orange Free State £337,081, and Natal £155,506.

The following interesting classification of white wages in the Transvaal is given:—

SALARIES AND WAGES—WHITE EMPLOYEES—YEAR 1913.

PROVINCE.	CLASSIFICATION.	GOLD MINING INDUSTRY.					Diamond Mines.	Coal Mines.	Base Mineral Mines.	Lime and Flint Works.	Totals.
		Mines.		Reef and Alluvial Diggers.	Metal lurgical Works and Tailings Works.	Total.					
		Witwatersrand.	Outside Witwatersrand.								
		£	£	£	£	£	£	£	£	£	£
TRANSVAAL	Technical Staff ..	742,820	84,802	33,092	8,291	827,622	21,369	53,661	28,088	12,054	930,740
	Clerical Staff ..	367,110	23,787			390,897	20,021	23,593	9,683		444,194
	Other White Employees	6,127,171	228,922			6,697,479	227,877	138,676	100,901		7,176,987
	Total	£7,537,101	337,511	33,092	8,291	7,915,998	269,267	215,930	138,672	12,054	8,551,921

Other members of the underground force drew pay as under:—

	1913. *Per day.* s. d.		1912. *Per day* s. d.
Shift bosses	25 9	... .	25 2
Timbermen ...	19 10	... .	20 10
Pipemen	18 7	......	19 1
Platelayers (underground) ...	18 10	...	18 7
Drill [illegible] and [illegible] [illegible] [illegible]	13 0	...	13 1
Banksmen and onsetters ...	13 11	...	11 7
Skipmen	16 3	.	15 9
Trammers and gangers ...	*11 7	..	11 0
Pumpmen	18 4	......	18 9
Underground engine drivers 12 5 to	21 8		20 5

*Supervisors only.

To Native, Asiatic and other coloured persons working on the mines £8,027,511 were paid out in wages during 1913, and of which the Transvaal amounts for £6,595,657. Whilst on the subject of labour we may remark that the February figures show that last month there were employed on Rand gold mines 20,506 whites and 159,247 coloured persons, whilst for the whole Union there were at work 28,750 whites and 213,531 natives. In March of last year the mines of the Union were employing 32,159 whites and 302,337 natives.

At the annual meeting of the Chamber of Mines, held on Monday last, Mr. John Munro, in dealing with the relative numbers of whites and natives employed, made the following important statement:—

In December, 1912, there were 8·28 natives for every white employed; in June, 1913, the proportion was 8·39, and in December it was 6·92. In December, 1913, there were 46,147 fewer natives and 1,665 fewer white employees working on the Witwatersrand gold mines than in June, 1913. The proportion of white employees out of work in consequence of the lack of native labour works out at one white employee for 27·71 natives. These figures conclusively prove that the oft-repeated charge that the mines were victimising the white employees in consequence of the strike in June and July is without foundation. On the contrary, a larger number of men were kept in employment than the number of natives employed warranted, in the hope that labour conditions would improve.

PROGRESS AT THE NEW KLEINFONTEIN.

Points from the Consulting Engineer's Report.

In his report for 1913, Mr. E. J. Way, consulting engineer of the New Kleinfontein, writes:—

The principal features of these operations which call for comment are: (1) The results of development; (2) results obtained for the year from the additional plant completed in the previous year.

(1) Results of Development.—The value of the ore exposed during the year was 7.39 dwts. over a milling width of 44.54 inches, as compared with 7.33 dwts. over a milling width of 45.61 inches for last year. Ninety-four per cent. of the development was carried out in the eastern and central sections of your mine, and the balance in the western and Orient sections. The small amount of work carried out in the western section is due to the fact that this area has been previously reported to be low grade, and as a great deal of low grade ore was standing developed in this section, it was thought advisable to concentrate work upon the eastern and central sections. In the Orient section practically no work has been done since the May strike, which accounts for the small percentage of development done in that section. The payable ore reserves as at 31st December, 1913, amounted, on a milling basis, to 1,345.216 tons, having an average value of 7.53 dwts. On a mining basis the payable tonnage amounts to 1,658,481 tons, having a value of 6.3 dwts. over a stoping width of 59.19 inches. The ore reserves are shown in the manager's report on a milling basis for the purpose of comparison with the previous year's ore reserves, and also on a mining basis for future comparison. The reason for this alteration is that the milling basis necessitates the assumption of a constant sorting percentage for the period following the date of calculation. In ordinary times this figure can be taken as being fairly constant, but when fluctuations in the labour supply take place, as at present, it is not possible to maintain a fixed percentage of sorting. On the other hand, the mining basis can at all times be readily converted to the milling basis by applying the percentage of sorting which is being accomplished at the period in question. In future, therefore, the reserves will be taken always on a mining basis. Eastern Section.—The eastern subsidiary shaft has been sunk to a total depth of 2,784 feet 6 inches below the collar to date, which, with the east shaft, which is sunk to the 14th level, a distance af 2,060 feet, gives a total depth of main incline shaft work in the eastern section of 4,844 feet 6 inches. Central Section.—An encouraging feature in the development of the central section is that a great portion of the unpayable ground on the 18th level east during 1912 has now been transferred to the payable reserves as a result of a further Main Reef seam being exposed in the boxholes put up to Main Reef Leader. The disturbed nature of the ground west of the Central Shaft has entailed a large amount of cross-cutting, but the reef has now been cut on all levels. It is noteworthy that this shaft is now 4,651 feet below the collar, and it is the intention of the management to continue this shaft another two levels during 1914. Western Section.—The small amount of development carried out on the Main Reef during the year is of comparatively high value, namely 9.24 dwts over a milling width of 49.03 inches. This development was selective, and was only carried out in the known better grade portions of this section. Orient Section.—The amount of development done in this section was so little that it does not call for comment on this occasion.

(2) Results obtained for the year from the additional plant completed in the previous year.—The manager, in his report, gives very clearly, on page 11, the whole of the results obtained from the reduction plant during the year. With regard to capacity, the plant has come up to expectations, but the extraction results are about the same as they were last year, namely, 94.66 per cent., as compared with 94.60 per cent. in 1912 and 95.79 in 1911. This matter has been gone into very carefully, and it would appear that some improvement can be made in the extraction in the slimes section of the secondary treatment plant. This plant, as you are aware, was enlarged last year, but it has been found that the large amount of the fine sand which passes the 200 mesh screen, and which is treated with the slime, has caused certain difficulties in the agitating plant, which circulates the slime and fine sand for a given number of hours by means of centrifugal pumps. It was also found, owing to the high efficiency of the tube mills, that a somewhat larger charge passed to this section of the plant than was originally allowed for, and with a view to improving extraction and of slightly increasing the capacity of this plant, it has been decided to erect three Brown agitator tanks, the cost of which has been already provided for out of working costs during the year under review. Life of Mine.—One year has elapsed since my estimate of the life of the mine was submitted to you. In that estimate I stated that I was of opinion that, milling at the rate of 50,000 tons per month, the life could be reckoned at 13 years. Nothing has occurred during the year to alter the basis upon which my estimate was made, and I now have to state that I am of opinion that your mine has a life of 12 years from 1st January, 1914. The belief expressed in the concluding paragraph of my last year's report, that the working results for the year 1913 would surpass those of the previous year have not been fulfilled, but this is due to the delays, setbacks and disorganisation caused by the strike, commencing in May, through which a total of seven weeks' work was practically entirely lost as far as profit earning was concerned. In spite of this, the gross working profit was only £9.130 less than the previous year, so that had times been normal my hopes would have been realised.

Messina (Transvaal) Development.

The following are the results of the February operations at the property of the Messina (Transvaal) Development Company, Ltd.:—5,405 tons of ore were treated, producing 1,069·33 tons concentrates, average assay value 39·7 per cent. copper. Smelter treated 316 tons middling and produced 66·75 tons of matte, average assay value 59·4 per cent. Total output of concentrates and matte, 1,136·08 tons, average assay value 40·8 per cent. 447 tons of 10 per cent. middling were also produced. Total development footage, 167 feet. Water flowing in Sand River, so that Huntingdon mill can now be run regularly.

Conditions at De Beers.

Reuter South African Press Agency has been handed the following statement by the Secretary of the Dominions Royal Commission:—At Kimberley the Commission heard evidence from Mr. Grimmer, Assistant General Manager of De Beers, who stated that his company could demonstrate that they had sufficient ore at present rates of production to last fifty years, and that the life of the mines would probably be much longer. With their present plant they could double their output at any time. Dealing with the question of native labour, Mr. Grimmer brought out the following points: The ease with which De Beers could obtain the necessary supply; their inappreciable expenditure on recruiting, as compared with £600.000 for 1912-13 on the Rand; the frequency with which natives returned for further periods of work, and the abscence of an upward tendency in native wages during the last few years. In connection with the question of wages, Mr. Grimmer stated that the average was 3s. 4d. per day, and the cost of food and clothing, which the natives bought for themselves, averaged 1s. 2d. per day. This contrasted with an average on the Witwatersrand of 1s. 11½d. on food in September, 1913. On the question of white labour, Mr. Grimmer informed the Commission that wages had increased in recent years, those for miners now ranging from 22s. 6d. to 25s. a shift. He also stated that there was a strong tendency for successive generations of white employees to join the company's service, and the company found all apprentices they wanted. Mr. Grimmer also told the Commission that De Beers contributed to the revenue of the Union—directly and indirectly—some £776,000 per annum.

Get Your Certificate.

Private Individual Tuition for Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine Drivers' Examinations. Practical Mathematics and Electrotechnics. Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings, Box 2061

VENTILATION ON THE MINES OF THE RAND.

The Problem of Obtaining Healthier Conditions.

[By G. H. Blenkinsop.]*

The discussion on my paper has dealt largely with the temperatures in the mines, and with the method which I used in calculating underground temperatures. Attention was called by some of the speakers to a paper read before this Society at the May meeting, 1911, by Messrs. J. Whitehouse and W. L. Wotherspoon, and it appears to be the opinion of the said speakers that this paper settled the question of mine temperatures once for all. The temperatures given in Messrs. Whitehouse and Wotherspoon's paper are, however, lower than those returned to the Mines Department by the different mines on the Rand, see Table No. 30, in the annual report of the Mines Department for 1912.

Some of the speakers evidently thought that as I had taken lateral distance into account in my calculations that I held the opinion that temperatures increased with lateral distance as well as with depth. I am surprised at this, for it proves that the correct method of taking temperatures underground is not generally understood.

I will here state a fact, that must not be lost sight of in ascertaining the temperature of underground workings.

A current of air passing over a moderately-heated surface such as the rock face of underground workings, absorbs heat at the rate of 5 degrees for every 1,000 feet traversed. This is when the velocity of the current is at the rate of sixteen feet per second, and this rate is practically the velocity at which the air currents produced by fan ventilation travel. I wish to call attention to the point that I mention moderately-heated surfaces for air passed over highly-heated surfaces such as the stove of a Blast Furnace absorbs heat very rapidly. The figure of 5 degrees for every 1,000 feet has been established as the result of careful tests made in England, Germany, France, Belgium, and New Zealand.

This being so, if the temperature of the atmosphere at the top of a downcast shaft is 50 degrees the temperature of the air current at the bottom of the said downcast shaft will be 67.5 degrees, assuming that the shaft is 3,500 feet deep. 3,500 feet at 5 degrees per 1,000 equals 17.5 degrees. This is the increase in the temperature of the current of air caused by its passage down a shaft 3,500 feet deep. The rock temperature at the bottom of the said shaft may be 80 or 85 degrees. Now if we trace the current of air from the bottom of the shaft along the levels to the working faces we shall find that it increases in temperature 5 degrees for every 1,000 feet traversed until the temperature of the air current and the rock temperature are approximately the same. I trust it will now be understood why I took the lateral distance into account when calculating the temperatures at the working faces. Some few meetings ago a member read a paper in which he damned the practical man up-hill and down dale. The practical man is some times useful, for example, practical experience would have shown Messrs. Whitehouse and Wotherspoon that temperatures taken at or near the bottom of a downcast shaft, are very much lower than the actual mine temperature, i.e., the temperatures at the working faces. Consequently, their paper has no value as far as mine temperatures are concerned. This is confirmed by the difference between the temperatures returned to the Mines Department by the Village Deep Mine, and those returned by other mines of about equal depth which also have mechanical ventilation. Mr. Walton stated in his remarks that the temperature at his mine, the Rose Deep, is 73 degrees, that being so, one is curious to know why he has made a declaration to the Mines Department (see Table 30, already quoted), that the average temperature in the Rose Deep is 83 degrees.

Before I leave this question of temperatures I would mention that Mr. Moynihan read a paper before the December meeting of this Institute as his contribution to the discussion on my paper, in which he says: "The author's main object is to lower the temperature in the working places of the Rand." Now, there is nothing in my paper from beginning to end which points to this conclusion. Mr. Moynihan could not have read my paper. To use an American expression, he was "talking through his hat" and it would be a waste of time to refer to his remarks. If Mr. Moynihan would like to read an impartial resume of my paper he will find it in the "Mining Magazine" for November last.

It is stated in my paper that the object is to supply pure air to the working faces. Nothing is said about supplying air of lower temperature. The reason for referring in my paper to the temperature in the mines is that medical experts are unanimous in saying that at a temperature of [illegible] degrees F. and above persons working in it have a lowered physical resistance to disease, and are therefore particularly liable to be affected by small quantities of dust in the air and any other impurities which the air may contain. One speaker stated that fan ventilation removes dust-laden air from the mine; that is so, but not until after it has been breathed by the workers. It has been said that the system of ventilation, which I advocate, will stir up dust; this, however, does not happen, for the pipe conveying the air to a working face will have a diameter of, say, 2½ inches, or, say, an area of 4.9 inches. At the end of this pipe is attached a bell-shaped mouth piece, having an outlet of [illegible] inches in diameter, or an area of, say, [illegible] inches; consequently the pressure of, say, [illegible] to 12 ounces at the outlet of the 2½ inch pipe is so reduced at the outlet of the bell-shaped mouth piece that it is not sufficient to blow out a candle. The fresh air diffuses itself gently over the working face, there is no draught or rush of air. I state this from actual experience for I have used this system of ventilation at two mines.

At the November meeting of this Society, Mr. H. C. Boydell read a paper in which he stated that ventilation by blowers had been tried in Australia, and had proved a failure. He gave an instance where the quantity of air actually delivered at the faces amounted to only 13 per cent. of the capacity of the blowers. It is so evident that this loss of air between the blowers and the faces must have been owing to perforated air pipes, or faulty connections, that I am surprised at such silly statements being made before a scientific society. Mr. Boydell's account of Australian experience is simply a record of incompetence. What would happen at a Rand mine if only 13 per cent. of the air from the compressors reached the working faces? As you all know, the pressure of air supplied to the machines at the Rand Mines is 70lb. and upwards, as against 8 to 12 ounces from a Roots, or similar blower.

Other points which have been mentioned during the discussion are the cost of the installation and the H.P. required. In my paper I state that the cost of an installation for a mine employing a total of 2,000 workers underground would be less than £10,000. This figure is based on actual experience of this class of work. For obvious reasons one cannot be expected to publicly furnish a complete specification. With reference to the H.P. required, some alarming figures have been mentioned during the discussion. The H.P. required for Roots' blowers capable of supplying 100,000 cubic feet of air per minute at a pressure of 12 ounces, plus the H.P. required to overcome friction in the pipes is 600 to 650 as determined by the length of pipes.

It has been stated recently that spraying has removed the dust peril. Spraying has undoubtedly improved underground conditions, for, as stated in my paper, a large percentage of the dust produced by drilling, blasting, and shovelling, has been allayed by the carrying out of the regulations for the allaying of dust. The very fine dust, that is, the impalpable dust, cannot be allayed by spraying, and it is this impalpable dust which has such an injurious effect on persons whose physical resistance is lowered by the temperature of the air in which they work.

In smelting works in Europe and America large sums of money have been spent and numerous devices tried for the purpose of arresting the fine dust from smelting furnaces, which dust contains appreciable gold, silver, etc., values. I gave a lot of attention to this subject at a smelting works which I controlled, and I obtained the most satisfactory results by the use of dust chambers and culverts or flues, having an area several times greater than the outlet or mouth of the chimneys. This system gave a quiescent zone, in which the very fine dust could settle. In a current of air such as that produced by, say, 16 feet per second, it is impossible to allay the very fine or impalpable dust by spraying. I wish to call particular attention to this statement that spraying will not allay the very fine particles of dust, whether the spraying is done by water alone or a mixture of water and molasses, even when the current of air is only travelling slowly, and I think a very little consideration will convince anyone that fine dust will not settle when the current of air is travelling at the arte of, say, 16 feet per second. I trust that no one will gather the impression that I advocate the erection of dust chambers underground. I have given this information for the purpose of illustrating how difficult it is to bring about the settlement or deposition of very fine dust. The use of water drills will reduce the quantity of very fine dust produced, but fine dust will always be largely produced by blasting.

A feature of the system of ventilation which I advocate is that it ventilates the whole of the mine and not simply the main roadways. The fresh air liberated at the working faces diffuses itself throughout the whole mine and replaces an equal quantity of air laden with impalpable dust and other injurious impurities. If, say, a total of 100,000 cubic feet of fresh air per minute is liberated at the working faces, an equal quantity of foul air must be forced out of the mine. Each shaft will act as an upcast shaft or outlet for the impure air. It is proposed to work the blowers night and day, and also during the week-end stoppage. The whole of the mine workings, stopes as well as drifts, should, in a very short time be as sweet as the proverbial nut if this system of ventilation is adopted.

In conclusion, I beg to thank those gentlemen who have taken part in the discussion, and I think we are all agreed that the subject of improved ventilation of the mines of the Rand is one of great importance, for improved ventilation means not only healthier conditions for the workers, it also means a substantial reduction in working costs. I think it will be found that the mines which have the lowest working costs are also the best ventilated.

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*Read before the C.M. & M. Society of S.A.

At a meeting of the Heroine Gold Mining Company, Ltd., recently held in Capetown, it was resolved: (1) That the company be placed in voluntary liquidation in terms of Section 178, Clause 2, of the Companies Act of 1892. (2) That the following be and hereby are appointed liquidators, viz., Messrs. C. Friedlander, A. J. Friedlander, A. Wagner, M. Kuller, T. A. Patterson, and T. D. Jearey.

THE MANAGER AND STAFF OF THE NEW UNIFIED MAIN REEF G.M. CO., LTD.

Seated (left to right).—C. L. Dewar (Mill overseer), J. Lowes (engineer), P. J. Holliday (secretary), W. A. Krige (manager), R. Cunningham (mine captain), J. Davidson (cyanide overseer), T. G. Martyn (assayer).

Second row.—W. F. Davies (Hospital superintendent), E. V. R. Munro (electrician), A. C. Bissett (surveyor), A. H. Guy (storekeeper), E. Hurford (compound overseer), E. L. Steele (assistant mine captain), W. Morrison (foreman fitter).

Third row.—J. R. Alison (timekeeper), M. Hoffman (assistant sampler), E. D. Raine (shift boss), J. Wood (assistant storekeeper), R. T. Murray (foreman carpenter), E. C. Morgan (native timekeeper), J. F. Stewart (boilermaker), R. Green (assistant assayer).

Fourth row.—E. Rubidge (assay learner), E. H. Machell (clerk), J. Hoffman (compound assistant), W. P. Tonkin (foreman smith), G. Effune (assistant native timekeeper).

(R. Olliver, Photo, 98, Pritchard Street.)

ANNUAL REPORT OF THE APEX MINES.

Property and Financial Position—Profit from Coal Section—Points from the Reports.

[illegible] the directors' annual report of the Apex Mines states: The property consists of the freehold of the proclaimed farm Rietfontein No. 11, district Boksburg, from which three portions, amounting in all to 34 morgen 551·61 square roods have been transferred during the year to the Union Government for railway purposes, leaving an area of 3,542 morgen 115·39 square roods over which the company also owns the coal rights. The owners' reservations embrace the surface rights of 146 morgen 29 sq. roods and a gold mining area equal to 1,115·3 claims, with 14 stands in Wolhuter Township, on which is constructed a railway siding belonging to the company. The net profit from the coal section amounted to £28,357; the balance unappropriated from the previous year was £29,935, and the total amount thus available has been treated as follows: Government tax on coal-winning profits, £1,456; amount appropriated for capital expenditure, £14,953; balance unappropriated, £41,883; total, £58,292. As it was considered essential to keep the mine free from water during the negotiations for the provision of further working capital, pumping from the shaft of the gold section has been continued throughout the year, and the cost, together with general and maintenance expenditure, amounted in all to £20,258. Portion of this amount was met from capital funds unexpended at the close of last year, and the remainder, viz., £15,701, has been met from the profits of the coal section. The water has been sold, and the amount realised from the sale has been set against the cost of pumping. Owing to the exhaustion of the capital funds, and the necessity of applying the coal profits to meet the expenditure of the gold section, no dividend was declared. The negotiations for the amalgamation of the company with the Benoni Consolidated Gold Mines, Ltd., which were reported last year, did not result in the presention of an acceptable scheme. At the date of this report an offer has been received from the New Kleinfontein Company for the purchase of the gold section of your property. At the colliery the output was 177,467 tons, a decrease of 25,731 tons as compared with last year. This decrease is due to the falling off in the demand for Springs quality coal. The company continues to hold an option to lease the coal rights of the farm Groenfontein No. 159, in the district of Middelburg. The work of the gold section has been restricted to pumping operations. The ore reserve position remains at: Payable, 496,138 tons; milling width, 59·37 inches; milling value, 6·18 dwts. Unpayable: 96,285 tons; width, 41·96 inches; value, 1·65 dwts.

PROGRESS AT THE COAL SECTION.

In his report on the operations of the coal section of the Apex Company during the period from 1st January to the 31st December, 1913, the Manager, Mr. J. R. Thom, writes:—The whole of the machinery and plant has been maintained in good working order and has run throughout the year without a single hitch. The mine development, in comparison with our output, has been satisfactory during the year. Figures are attached showing the actual tonnage despatched during the year. The development amounts to 2,330 feet, representing an area of 17·2 acres available for mining purposes, which will yield 176,264 tons of clean coal. During the year a shaft was sunk on the west side of the main shaft for ventilation purposes. The mechanical haulage has been extended throughout the year as occasion required, so that tramming by manual labour is reduced to a minimum. The coal cutters are working very well—the greater proportion of our coal being undercut by them. The quarry has been workable throughout the whole of the year, but the demand for stone has been very limited. The quantity of stone extracted during the year is estimated at 2,580 tons. All the buildings and quarters on the property have been kept in a good state of repair. The result of the year's work shows a falling off in profits, which is attributable to the scarcity of orders, also reduction in selling prices. The total output for the year 1913 as compared with the previous year was as follows:—

	1912.	1913.
	Tons.	*Tons.*
Round coal	144,918	126,270·2
Nut coal	43,520	40,756
Pea coal	12,496	10,441
Pearl coal...........	2,020	—
Duff coal	234	—
Total	203,198	177,467·2

BOOKS RECEIVED.

THE COPPER HANDBOOK, 1914.

Volume XI, the 1914 edition of "The Copper Handbook," is just received. Former issues of this work, by Horace J. Stevens, were considered the standard authority on the subject of copper and copper mines for the entire globe. The new work has been entirely rewritten by Walter Harvey Weed, the recognised authority on copper mining and an engineer and geologist of international reputation. The new volume has several innovations which make it very much more valuable to the reader. The most important is unquestionably the Geographical Index, which gives at a glance the names of all mining companies operating in or near any town in America or in any foreign country. If you forget the name of the company, but remember the locality, this list enables you to spot it. Mr. Weed has also separated off dead companies and grouped them in a dead list, in which the vital facts and references are given. The greater part of the book, as in former annual editions, is devoted to descriptions of the copper mines of the world, the amount of their holdings, their officials, finances, profit and loss, mines, output, nature of ore, geology, methods of mining, milling and smelting, with descriptions of plants and probable future, successful or otherwise, of the company. (Published by Walter Harvey Weed, Houghton, Mich.)

Union Petroleum Prospects.

In the House of Assembly last week, Mr. O. A. Oosthuisen, the member for Jansenville, asked the Minister of Lands whether, in view of the report of Mr. Cunningham Craig on petroleum prospects, Government is prepared to put down a trial hole in the vicinity of Klipplaat, or, if not there, at some other spot indicated by Mr. Craig? The Minister of Lands replied: The Government does not propose to embark money in prospecting operations for petroleum at present, but Mr. Craig's recommendations will receive consideration during the coming year. Further, the Government is always prepared to consider the question of assisting mining development, provided that the chances of discovery are considered by its technical advisers to warrant expenditure and if other conditions are suitable.

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LABOUR AND THE COLOUR QUESTION IN SOUTH AFRICA.

Pioneer Mine Manager's Views on the Need for Removal of the " Colour Bar."

[By W. Blane.]*

The present white labour troubles in South Africa reveal a condition so serious that some inquiry is inevitable, and it is proposed in this article to discuss the situation with a view to finding some possible solution of the difficuilties surrounding it. In South Africa, with the exception of some parts of the Cape Province, a coloured man may not do a white man's work. In the Transvaal he is debarred by statute from becoming an engineer or a miner. He may not take charge of a steam engine or boiler, nor may he hold a blasting certificate. It is an unwritten law that no native shall be an artisan. Skilled labour in all its branches is reserved for the European, as well as every position of responsibility in connection with the industries of the country. In China the railways, mines, and workshops are all manned by Chinese. In India they are manned by Indians, with the exception that about one-third of the engine-drivers and firemen on the railways are, for political reasons, English. In both these countries there are the coolie classes who do the meaner work, just as in European countries there are the labouring classes. In South Africa Indians and Chinese come under the colour ban with the native, and every African workman is, in his own country, classed as a coolie. He must not come into competition with the white man. And the white man, however unskilled, must engage in " skilled " labour or remain idle. The labour system of to-day is a perpetuation in milder form of that practised by the early Dutch settlers. Then it was probably the only way possible, and it still presents advantages from the white workman's point of view. It is also claimed by some politicians as essential to the maintenance of the prestige of the white man, while others contend that if the white man's prestige, after two hundred and fifty years' contact with the African races, needs to be maintained at all, it should be by worth and not by colour. The defects of the system, however varied, are many and obvious, and it may well be questioned whether some change may not now be introduced for the general good.

When the gold mines were opened up, in the late 'eighties, they gave such promise that it was difficult to imagine that the severe practice of economies would become necessary to their very existence. The lead given by the diamond mines of Kimberley was followed, and white miners made " bosses " of native labourers, with the understanding that they should not teach them their art, but use them to do their work. It will not readily be denied that any experienced mining engineer, assisted by capable departmental managers, could (given a few months to effect the change) run a mine on the Rand with coloured labour only. It has been done before now. The leaders of the industry have known this all along, but they have kept the white miner in his position notwithstanding, from purely sentimental considerations. Again and again the opportunity has occurred of lowering his wages, but it has not been taken advantage of, and he earns as much to-day as he did twenty years ago. If he is kept in his position at all the fairness of this statement is apparent, for the mines are deeper and the work more hazardous. But, to the industry and to the country, the retaining of the white man in a position that necessitates the permanent subordination of the native is not so evident. This is a matter of human interest and of national concern. The native of South Africa is not slow to learn, nor is he without a fair share of ambition. With the coming of the white man the possibility of advancement along his own traditional lines was cut off, and all that is offered him in return is permanent drudgery—the position of a servant of servants in the exploitation of his own country for the advancement and enrichment of strangers. Small wonder that, after giving the new conditions a six months' trial, he elects to stay at home and cultivate his hired mealie patch, although that means giving half the increase to the owner. For this is what happens. Every month some thousands of raw natives are marched to the Rand, the recruiting costing several pounds a head, and every month as many trained and useful workers leave dissatisfied. In this way the whole labour force changes within two years, every change costing the mining industry close on a million pounds sterling, besides perpetuating danger and inefficiency. That recruits are obtainable in such quantities, in face of the adverse reports spread by those who have returned, is proof of the willingness of the younger men to work and to give the new conditions a fair trial. But the result is always the same.

The highest position open to a native is that of " boss boy," which means that he interprets for the man in charge and serves as a buffer between him and the other " boys." These " boss boys " often remain for years, and will return again and again to work after a short holiday. This obtains in every department, on the railways as well as on the mines, and is evidence that, with reasonable hope of advancement, the native would become a constant and reliable factor. Many natives are quite capable of taking charge of a stope or a drive. If only these and similar position were open to them the end of all this shortage of labour would be well in sight. And, if the trades and professions were open to every man, whatever his colour, a new and better era would soon dawn for South Africa. It is reasonable to suppose that native labour under skilled and capable native supervisors would be more productive than at present. It will be retorted that skilled and capable native supervisors do not exist. This is, to some extent, true, and, to that extent, is the strongest possible condemnation of the present system. The habit of responsibility is a thing of growth. The question of wages recurs continually when shortage of labour is under discussion. Like everyone else, the mine " boy " wants all the money he can get for his work. From time to time experiments have been made in this matter. At the time of the repatriation of the Chinese a large increase of pay was offered, and the level then reached has since been maintained It would be difficult to gauge the effect of this policy as a recruiting factor, although, judging from the monthly returns, it must be slight. But, as a means of retaining the men, it is a failure. Experience has shown that the more they make the shorter time they stay. There is no future for them at the mines, and, therefore, so soon as they make what money they require they return to their homes. A white miner may rise to be manager of a mine, but a coloured man can never succeed to a white man's job. The average " boy's " pay is from 2s. to 3s. a day, with food and lodging. The white miner over him gets 15s. to £1 a day, if paid by the shift, and if on contract may make considerably more. Artisans, such as carpenters and fitters, are paid £1 a day in the Transvaal. Sooner or later the sentiment that fixes so great a gulf between the wages, and consequently between the standards of living, of white and black must give way. The margin of profit on gold mining on the Rand becomes smaller every year, and now stands at less than 10s. per ton average. There are many mines closed down because they are too poor to pay under existing conditions, and some of those still working can barely make ends meet. Before many years the gold industry must face a struggle for existence, if indeed it has not already begun. Economies are being enforced in various directions, and it will be surprising if advantage is not taken of the present crisis to bring the re-grading of workers and wages into the sphere of practical economics.

The housing of native employees has, doubtless, some bearing on the subject. The compound system in vogue at Kimberley was adopted on the Rand with some modifications. The precautions against theft, necessary on the diamond fields, are not taken in Johannesburg. The workers are free to go and come when they please, the only restriction being that they may not be out after certain hours without a permit. This is not a compound but a municipal regulation, and is common all over the country and applies to domestic servants as well as to mine " boys." Compound life is not conducive to the development of individuality. There are no educational facilities. The worst feature is the absence of family life, and the native is, before everything else, a family man. Some effort has been made to improve these conditions, but the continual coming and going of the workers and their disinclination to bring their families away from their homes are factors that militate against reform on a large and revolutionary scale. The compound and its accompanying evils would, however, gradually disappear before natural family life if the root evil of permanent industrial subjugation were removed. How would the change affect these white men? This question comes so naturally as to suggest the crux of the position. It is one of the penalties of progress that to some every new departure brings temporary hardships. Seldom are these hardships accepted philosophically, but as seldom do they eventuate in permanent suffering. This is especially the case in new countries where there are few vested interests, and wide fields for the display of talent and energy. If the position of the white workman in South Africa can be shown to be permanently impossible, he himself may be ready to assist in the inauguration of the necessary reforms. That this is so may be easily deduced from the impossibility of keeping the coloured man always as and where he is to-day. But it is quite as clear from an examination of his own position. Take, for example, the case of the miner and others classed as unskilled workers in their own country. These do no manual labour in South Africa. The artisan must work as he did at Home for the simple reason that the natives may not use his tools nor follow his craft. The miner and labourer are at once elevated to be " bosses " and placed over gangs of natives, of whose language and customs they are entirely ignorant.

The first thing these men discover is that they have white skins while those they see doing the work they did in the Old Country have not that advantage. On this all their future ideas are based. They gradually pick up a few " Kaffir " words and one or two strong and not over polite phrases in which to express orders, but rarely is any time devoted to the study of the native languages. When this meagre linguistic stock-in-trade fails, their own colloquial expletives are freely requisitioned, for it is remarkable how quickly men in this position lose their tempers when not understood. And the native, however, resentful he may feel, must not retort by word or gesture—he is a " Kaffir." His intelligence, or want of it, is no factor. He must do as he is told, and as a rule he grasps the position so well that he does nothing else, if as much. These white overseers have no fear of being overtaken from the rear. Those under them may never aspire to take their places, hence they themselves seldom advance. This is perhaps the most unhealthy condition that could attach to industrial life. The man behind is the forcing factor in every well-regulated concern. As he must advance, those ahead of him may not stand still. After a few years of this a man is good for nothing else. He could not do a day's work in any other country and would not in South Africa. He has acquired a dictatorial manner and would resent being ordered about. Even if he could work at home he could not exist on his earnings, for his wages are three or four times what they would be in the Old Country. His wife has acquired the habit of spending money. If she has been with him in South Africa she has become accustomed to having a servant to wait on her, and his children have been encouraged to order men about with insolence and with impunity. These, and others too well known, are heavy penalties to pay for the maintenance of a position that results in the permanent industrial subjection of the great majority. And, be it said in their defence, this position, at once false and demoralising, is not made by the men themselves. It is there for them when they arrive in the country, the result of custom and convention instituted in the days of Van Riebeck and fostered by Dutch and English alike through two hundred and fifty years, the least progressive that could well be imagined. With the employment of skilled coloured labour would come a re-grading of wages. This might mean a reduction of pay for those who cannot rise to higher positions than that of overseer. In India an Indian may do the same work as an Englishman, but he rarely, if ever, gets the same pay. With any lowering of wages would come a corresponding reduction of the cost of living, brought about by a change in the manner of living and the natural combination of altered circumstances. The Cape Province gives evidence to this effect. There a man earning only half what he might earn in the Transvaal can rarely be induced to go north, because he is more comfortable at the Cape on 10s. a day than he would be in the Transvaal with twice as much. If he goes to the Transvaal he must adopt the standard of living prevailing there, and this would leave him poorer at the year's end. By no system of reasoning can it be shown that the cost of living in two parts of a Dominion, separated by an imaginary line, occupied by the same races and communicating by rail, can be maintained for long at a ratio of two to one. The thing is a physical impossibility. The truth is that the standard of living calls for more attention than the cost of living, especially in the Transvaal.

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* In the " Nineteenth Century."

Another effect would be the gradual decrease of the *proportion* of white men on the mines, and to some extent in other industries as well. This would, in all probability, synchronise with the increase of native workers and the extension of operations consequent on the new conditions. Thus the actual number of white men might never be appreciably less during the transition period, while in the near future it would be greater. These anticipations are reasonable. Under present conditions the mining industry alone could employ 400,000 natives, and less than 200,000 are available. It is well known that the white miners of the Rand are mostly drawn from Cumberland, Cornwall and Scotland, and they are still found in groups under managers from their own districts. In the early days, and until quite recently, this was a pronounced feature, and when a manager, or even a shift boss, changed from one mine to another his men went with him, and the new manager replaced them by his own followers. Where everything is strange this is quite natural and, guided by the same law, coloured men will rally round their compatriots when they are allowed to hold responsible positions. It will be remembered by many that, before the Witwatersrand Native Labour Association undertook the distribution of natives among the mines, a compound manager who had been brought up beside natives and who knew their language and commanded their confidence could always keep his mine fully manned.

The new conditions would reduce working expenses and make the establishment and expansion of industries possible all over the country. The one industry that has grown to any considerable extent is mining. The large measure of protection given to some others by the Union Tariff has failed to make South Africa a manufacturing country. Even where the country produces and exports the raw materials necessary for the manufacturer it is impossible to make progress. The case of woollen goods is an example. There is a protective duty of 25 per cent. on these, yet wool continues to be exported and woollen goods imported in increasing quantities. This is solely owing to the inefficiency and excessive cost of labour. At the mines the working expenses are to-day 50 per cent. less than they were a few years ago, but even the present figures of 17s. to 18s. a ton for mining and reduction costs is acknowledged to be too high. With working costs in the region of 12s. the output of ore from the Main Reef deposits alone could be greatly increased and the lives of the mines prolonged. In addition, the Kimberley Reef series and the Bird Reef, lying to the south, would become practical propositions. With all this expansion in view the white men have little to fear from skilled native labour. They would be numerically greater in the long run, if proportionately less, and the positions open to them would be of a more permanent and dignified nature.

It is not within the scope of this article to deal with the labour troubles that paralysed the country in July last, and again during the past month. But the utter disregard by the white strikers for the positon created by an army of 200,000 natives being thrown idle demands attention. The strikers were in charge of these natives, and yet they left them uncontrolled and unguided, regardless of the risk of their rioting at will, and of the consequences to the industry and the Government. This want of respect for what was clearly a moral obligation was the worst feature of the situation, and, but for the firm and timely action of the Government, might have resulted seriously. That the natives behaved with such restraint must be remembered to their credit when the day of reckoning comes.

The native problem, in its wider aspect, is a much more serious matter than is supposed by those who enter the country with the cry of "A White South Africa." The hope of its ultimate solution lies along industrial lines. Social equality is impossible. Political equality is impracticable. And, if equal opportunity in the field of industry is to be permanently denied to four-fifths of the population, along what lines can they possibly make progress? The gospel of labour as preached in Africa to the African is one without hope. Where in the Western world of work is the man who does not hope to better his position by industry and to fit his son for a higher post than he himself occupies? Once it is possible for the African to better his position by labour and to give his children a better chance in life than he has himself, he will become the main factor in the development of an industrial and a peaceful South Africa. The regeneration of South Africa lies along these lines. This is the conclusion arrived at by the writer after over twenty years' experience on the Rand, in almost every capacity up to that of general manager.

Unworked Claims.

In the House of Assembly this week, Mr. Madeley (Springs) asked the Minister of Mines: (1) What was the number of claims held by the Rand mining groups which were not being worked with the object of extracting minerals, and what was the amount paid to the Government in licence money; (2) were any of these claims being worked agriculturally, and by whom; (3) was any squatting existing on any such claims, and, if so (4) what was the total number of squatters and what was the income derived by each group from such source? The Minister replied: (1) That claims were registered in the names of individuals, and not under groups. A compilation of the full return asked for would involve an immense amount of labour, and would not be of value. The Government was aware that large numbers of claims were not being worked. To insist on working, or on heavier taxation where conditions as regarded capital or development were unfavourable, would result in the abandonment of claims and loss of revenue to the country. (2) With the exception of certain agricultural leases on Klippoortje, the answer was in the negative. (3) The answer was in the negative. Validations of small existing occupations had been made from time to time under Section 76 of the Gold Law.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Sakalava Meeting.

To the Editor, *South African Mining Journal.*

Sir,—In reference to the question raised as to the legality of the ordinary general meeting of the company held on the 14th March, 1914, the board of directors submitted the matter to the company's solicitors, Messrs. Van Hulsteyn, Feltham & Ford. Their opinion and the opinion of counsel is that: " The notice convening the meeting complied with the articles of association for all the purposes of the meeting."—Yours, etc.,

C. M. TAYLOR, Secretary.

Sakalava Madagascar Proprietary Oil Fields, Ltd.,
71 Standard Theatre Buildings, Joubert Street,
Johannesburg, 24th March, 1914.

What's Wrong with South African Mining?

A PROSPECTOR'S OUTSPOKEN VIEWS.

To the Editor, *South African Mining Journal.*

Sir,—For the past few weeks you have been asking the above question, and have invited the opinions of those interested, both on the Rand and the outside mining areas of the Union. Perhaps an expression of opinion from a prospector in a very outside district—Zululand, to wit—may be of service. There does not appear anything very wrong with the mining in the Union, but there is a lot wrong with those having control of the industry. Apart from this, we are cursed by being ruled by an apathetic and unsympathetic Government, who are intent upon fostering the agricultural industry at the expense of the mining. Replying to Mr. Nathan, in the House of Assembly a few days ago, the Minister of Mines is reported to have said that " While the Government were anxious to encourage capital for the development of dormant mining areas, there was no intention of introducing legislation this session." Another report of the proceedings in Parliament informs us: " The Minister of Finance tabled particulars of additional expenditure. . . . The purchase, laying out, and improvement of land for land settlement purposes requires £100,000, and there is an addition of £425,000 to the original estimate of £800,000 for the funds of the Land Bank." The comparison in the treatment of the two industries by the Government herein portrayed needs little or no comment, but it is plain to be seen upon which industry their sympathies are focussed. Few, if any, of your readers but have read the usual platform oratory about getting the indigent Boer back to the land, and for that purpose the mining industry, while being bled for all it is worth, must always play second fiddle. The Government are with their everlasting taxation killing the industry; metaphorically, killing the bird that lays the golden eggs, and that, without having the gumption to secure a setting to propagate the species. Assuming that the reports we read of the life of the Rand mines are in part true, it is quite time some attention was given to outside districts. This is as much the business of the State as it is to bring back to the land the poor Dutch, who even with all the assistance the Union Land Bank can give them will never be anything else but an idle, thriftless lot. It behoveth those in power to see to it that the eggs of the old bird that pessimists say is dying slowly but surely should undergo a stage of incubation so that the supply can be continued when the old bird goes under. Many outside prospectors and mine-owners will agree with one of your recent correspondents who expressed the opinion that if the Rand were finished to-morrow there is plenty of gold in the outside districts to keep up the output. This is not too optimistic a statement. It is not the writer's intention to endeavour to boom any one district, but he may be pardoned for remarking that the mining potentialities of Zululand—a name tabooed on the Rand—have never been investigated. The wide belt of auriferous bankets extending from Nqutu district on the south-west to Hlabisa district on the north-east have never been explored. Yet wherever nature has denuded the surface sufficiently to expose the reefs, gold is to be found, and in many instances richer prospects than have ever been credited to the far-famed Rand. In addition to these banket series, there are gold-bearing sandstones, quartzites and schists all waiting development, awaiting the capital the Government have no intention of bringing in legislation to provide for. These auriferous belts are traceable for a distance of over 100 miles. Water power for all purposes is availaple along almost the whole extent, so that the estimate of 2½ dwts. for mining, milling, etc., given by Mr. Scott Alexander the other day in a letter to your journal was well within the mark. His estimate of values—5 to 6 dwts.—was very modest. Should he visit Zululand again in the near future, the writer may be in a position to show him rock that will average 18 dwts. across the extreme width of reef anywhere along its outcrop. At present it is unpegged and practically unprospected, waiting capital or the Millenium. But this is a digression; let us return to the subject of your query. And in doing so it may be as well to explain that the opinions herein expressed apply only to the Province of Natal, the mining laws of which differ somewhat from the Transvaal and other districts.

1. *Reducing or abolishing claim licences.*—It is not the cost of the licences that causes trouble, but the etceteras, registrations, amalgamations and so forth. These might be considerably modified, in fact it is difficult to see the necessity of renewing amalgamation licences every three months, but such is the law, and heavy penalties are incurred by those who neglect the duty. While on this subject it may be as well to refer to the iniquitous system of fines. Take up a copy of the Natal mining laws and you will find there is scarcely a rule or a regulation that is not enforcable by a fine, and are they not levied too on the slightest excuse, in fact the Department may be likened unto a mother admonishing an unruly child—" If you're naughty, I'll spank you." From the Mines Office we hear, " If you don't comply with the strict letter of the law, *as interpreted by us*, you will be fined." The rule or regulation is quoted glibly and the fine assessed. There is no happy medium twixt the poor prospector and the monied mine-owner. There is no such thing as going to a " Mines Bank " and borrowing the money. It's pay and look pleasant or abandon your holding. This kind of thing should be abolished where struggling prospectors are concerned.

2. *Throwing all farms open.*—The Prime Minister has repeatedly answered this query by advising all his followers and all farmers to stick to their land, and on no account to part with any portion of it. The present law regarding prospecting on private lands might well be modified with advantage to both prospector and owner.

3. *Foregoing transfer fees.*—Certainly, or at any rate considerably reduce the existing tariff.

4. *Direct financial assistance* has already been replied to by the Minister of Mines, not to be entertained at present. In regard to this, there is a certain sum voted by Parliament each year by giving assistance to prospectors. But seldom or never does one hear of a prospector being lucky enough to get any assistance. What becomes of this £5,000 per year? One grant of £1,500 or thereabouts was heard of some 18 months ago, but it was not given to a prospector. One must be well off in gold and in silver, in flocks and in herds to gain the ear of the Minister or of the Commissioner in matters of this kind, no poor man need apply. That the Government have money at their disposal was witnessed

some months ago, when Mr. "Hercules" Malan accomplished the feat of cleansing the augean mess at New Kleinfontein with a stream of Government gold. £47,000 would go a long way towards proving the banket series in Zululand.

The waiving or modifying of the existing Mining Regulations would best be left to a Commission, should such be appointed. A question is being asked the Minister of Mines on the latter subject in a few days. There are numerous ways besides those enumerated above whereby prospectors and small men could be helped, but space will not permit specifying them. A Commission would enquire into all such and should be a great benefit to industry generally. One of the many hardships a prospector has to put up with is the heavy expense of getting assays done. It is not every one can continue getting assay work done by private assayers. The Government Assay Department in Natal, as at present constituted, is unreliable, and a prospector is better off without assays than to depend on assays through that source. A thoroughly reliable Government Assay Department is a necessity, whereby prospectors and others can have their work done at a nominal cost. To regard every branch of the Department as a profit-earning institution is surely contrary to the anxious desire of the Government, as expressed by the Minister of Mines. It is a great mistake to make taxation and the imposition of fines a source of considerable revenue, when the object is to develop a new industry in dormant areas, yet such has ever been our experience in Natal.—Yours, etc.,

"EGO."

ANSWERS TO CORRESPONDENTS.

Mr. W. Hammond, Que Que.—See *S.A. Mining Journal*, November 1st, 8th, 15th, 22nd, 29th, and December 6th, 1913.

"Alpha."—Next week.

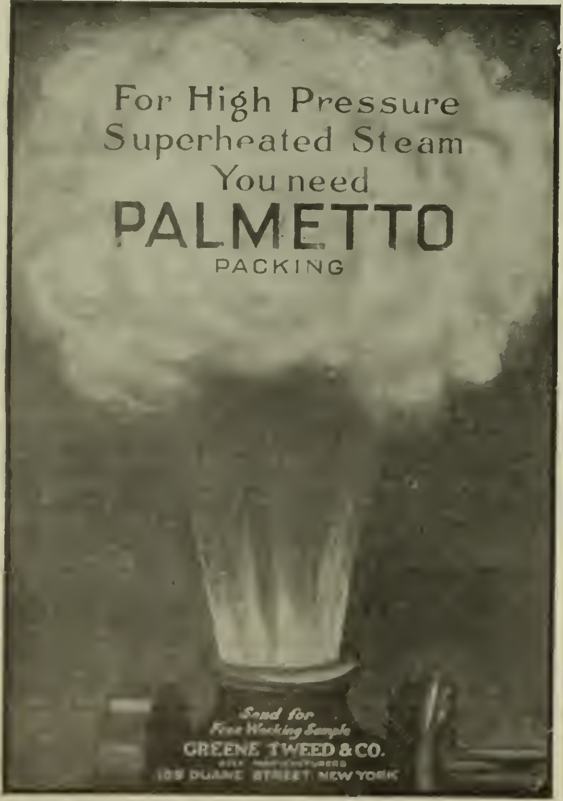
Electric Blasting Caps.

Electric blasting caps (fuses) are as strong as ordinary blasting caps; but as the capsule or shell is sealed up with a sulphur plug through which the wires are carried down to the fulminate. Not so many accidents occur in playing with them. They are generally dipped in dark-coloured wax, and are not such attractive playthings as the bright copper blasting caps; but "they get there just the same." Amateur electricians are earnestly advised to bury the electric cap a foot or two in the earth before trying to pass electric currents through the wires, and they had better not do it then. Don't open it to see what's in it! Explosive manufacturers are not given to imparting trade secrets promiscuously; but they will galdly tell what's in the caps and how they are made rather than have you blow your hands off trying to find out for yourself.

Swaziland Tin.

The following are the particulars in regard to this company's operations for the month of February: Concentrates recovered, 33·966 long tons; estimated profit (taking the price of tin at £175 per ton), £1,297; add adjustments in respect of previous shipments due to fluctuations in the price of tin, £31; net profit, £1,328.

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.



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Rhodesian Section.

LATEST MINING NEWS.

Rhodesian Asbestos and Other Minerals—Tributing the Bucks Reef—The Union Miniere—Umswezwe Copper—Mining Conferences.

Now that the Victoria Railway is completed, or at any rate is practically completed, development of the asbestos industry is anticipated. Speaking at the annual meeting of the Rhodesia Chamber of Mines, held in Bulawayo the other day, Mr. Wrey, who presided, remarked of the output of minerals other than gold: "The amounts and values of other metals and minerals declared are given in detail in the report. The total amounts to £253,673, which is less than last year by about £6,000. The production of diamonds is still insignificant; silver and lead are diminishing; in chrome iron ore the falling off was nearly 6,000 tons, while coal sales increased by about £5,000. An encouraging feature of the list is the reappearance in it of asbestos, which promises to bulk even more largely in the near future, if reasonable railway rates can be secured over the Victoria Railway, which is now nearing completion. As regards other minerals, there would appear to be little prospect of much active development in the near future, though we have hope that when the railway is extended from Sinoia to the North it will tap further coalfields."

* * * *

We understand that the Bucks Reef property is now being tributed by Mr. Black, the former manager for S. Neumann & Co., of the mine.

The Property consists of 280 claims of mining ground, also 3 acres of accommodation ground in Gwanda district. The property is north of the wide low-grade reef formation of the old West Nicholson Mine, and is about 2½ miles away from the Colleen Bawn railway station. The original claims of the Company number 70 in one comprehensive block, which contains both what may be termed the Bucks Reef line of reef, approximately east and west, and the Prestwood line of reef, approximately north-east and south-west. Then, to the north of such block, there is the Handcross separate block of 10 claims, and east of the Handcross the Beaufort separate block of 10 claims.

At the moment of writing we are unaware of the results now being secured.

* * * *

At the annual meeting of the Société Générale de Belgique, one of Belgium's leading banks, the chairman referred to the support extended to enterprise in the Congo. He said, *inter alia:* "The Union Minière du Haut Katanga, which is now under the control of the Générale, will very shortly start the working of its second set of 22 coke ovens. The copper output of the Union Minière in 1913 amounted to 7,300 tons. The technical staff is now on the tin properties of the company, ready to start work. It is hoped to be able to form during the current year the branch company to work the waterfalls leased to the Union Minière for the supply of electric power.

* * * *

Two samples of copper ore, taken from shafts about 300 yards apart on the area being prospected by the Umsweswe Asbestos Syndicate, Ltd., have been assayed by Mr. C. G. Bennett, assayer, Gatooma, and his report gives 38 per cent. and 40 per cent. copper per ton.

* * * *

Mr. Wrey threw out a very interesting and valuable suggestion at the Chamber of Mines meeting as to the value of mining conferences, which, we think, is here worth directing attention to. He remarked: "I would just throw out for your consideration an idea which has more and more during the past year been brought home to me, and that is the wonderful effect in straightening out difficulties which these meetings between the different sections of the industry have. I would go so far as to say that the question ought to be considered as to whether we, the mining industry, should not institute an annual mining congress on similar lines to the farmers' congress, for the purpose of meeting together and discussing all the matters affecting the industry, and making joint and united representations to the Government on the various points affecting our mutual interests. I feel sure that such a congress would go far to removing misunderstandings, and at the same time assist the Government in arriving at a correct estimate of the wishes of the industry.

The Rhodesian gold output for February was declared at 61,748 ounces, of the value of £259,888, an increase on the preceding month of 2,536 ounces, of the value of £10,856. The feature of the returns is that the Cam and Motor and Shamva mines figure in the list of producers for the first time, with 3,925 and 1,286 ounces respectively.

Rhodesian Mines and Minerals Ordinance.

"The Mines and Minerals Amendment Ordinance, 1913," which provided for the extension for one year of the terms of working laid down by Ordinance 10 of 1907, was passed by the Legislative Council and duly promulgated. The consideration of a large number of amendments suggested by the Government and the various mining Associations and Chambers was continued, and a Conference, of which a full report has been published, was held at Salisbury at the invitation of the British South Africa Company, early in January, 1914. Certain points which were brought up at this Conference still remain outstanding. The following list summarises the results of the Conference:—(a) Matters agreed to by all parties: (1) Thirty per cent. clause optional; (2) mineral oils, terms of working to be defined; (3) work done under discovery notice; (4) time of pegging; (5) posting of discovery notice without reef; (6) making safe of prospecting trenches; (7) Pegging over roads; (8) payment of royalty on separate metals; (9) payment of royalty on less than £200 per month; (10) payment of claim licences for monthly periods; (11) overlapping of periods of inspection and licences; (12) claim licences on base metal blocks; (13) game licences; (14) computation of trenching altered. (b) To be further considered with farmers: (15) protection of areas against pegging; (16) definition of cultivated lands; (17) cultivation of unworked claims. To be considered by mining bodies: (18) More stringent terms of working; (19) special protection. (d) Refusal for the present: (20) Alteration of base metal royalty; (21) registration under discovery notice; (22) measurement of irregular blocks; (23) excess pegging of several blocks; (24) wood rights, definition of. (e) To be considered by Directors or Legislative Council: (25) perpetual payment of claim licences on commuted blocks; (26) conversion of base metal in gold reef location; (27) payments on alluvial deposits; (28) base metal alluvial deposits. (f) No alteration of law required: (29) fencing of farms on gold belts; (30) unused water from mines.

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RHODESIA'S COAL RESOURCES.

Reserves Estimated at Practically One Thousand Million Tons—Correlations with South African Beds—The Geological Survey Director's Views.

So far only one colliery in Rhodesia has produced coal in any appreciable quantities—the Wankie Company's mine in Northern Matabeleland—but it has been known for a long time past that there are other extensive coal areas in the territory of the Chartered Company, most notably the Mafungabusi-Sengwe field in Southern, and the Luano field in Northern Rhodesia. In a most interesting bulletin, just issued by the Geological Survey of Southern Rhodesia, Messrs. H. B. Maufe (Director of the Survey), A. R. Thompson (Manager of the Wankie Mines) and B. Lightfoot (Geologist) give much useful data regarding the Wankie and other fields, and in view of the paucity of technical literature hitherto existing in regard to the carboniferous measures of Rhodesia, these papers are of marked and permanent value.

ACTUAL AND PROBABLE TONNAGES.

The Director in a table states the coal resources of Rhodesia to be actually 419,317,000 tons, plus a probable reserve of 550,094,000 tons, making a total of 969,411,000 metric tons. In the estimation of coal reserves a few thousand tons here or there are of no very particular consequence, and since the possible reserves in several areas are stated to be "relatively large" or "large," it seems fairly safe to reckon on an actual and probable reserve in the known coal fields of not less than one thousand million tons. At the same time it must be pointed out that the term "probable" has no very definite meaning or value in the estimation of the mineral contents of a particular piece of ground.

TONNAGES IN DISTRICTS.

Mr. Maufe's classification of this tonnage is as follows:—

		Seams.		Actual Reserve.			Probable Reserve.			Possible Reserve.
		No.	Thickness.	Area.	Class.	Metric Tons.	Area.	Class.	Metric Tons.	
TULI DISTRICT	Umsigwani	1	3′	1,000 ac.	B2	5,100,000				Relatively large.
	Singwesi	1	3′ 6″	300 ac.	A2	1,785,000				
	Massabi ..	1	4′	5,400 ac.	C	36,720,000	7 sq. miles	C	30,464,000	
SABI ..	.. ..	1	2′ 6″	1,750 ac.	B2	7,807,000				Relatively large
WANKIE ..	.. ..	1	6′ to 12′ 6″	20 sq. miles	B2	201,200,000	130 sq. miles	B2	400,000,000	
SEBUNGU Mafungabusi DISTRICT	Lubu ..	2	3′ and 2′				15 sq. miles	B3	81,550,000	
	Sengwe ..	1	5′	8,200 ac.	B3	69,700,000				
	Mafungabusi	2	10′ 9″ aggregate	3,500 ac.	D1	74,590,000				
LUFUA and LOSITO ..		2	4′ and 3′				5 sq. miles	B2	38,080,000	Large.
LUANO ..	.. ..	4	18′ 10″ aggregate	700 ac.	B2 or 3	22,415,000				Large.
		16	68′ 10″	52 sq. miles 370 ac		419,317,000	157 sq. milss		550,094,000	

Actual Reserve	..	419,317,000
Probable Reserve	..	550,094,000
Total	.. ..	969,411,000 Metric Tons

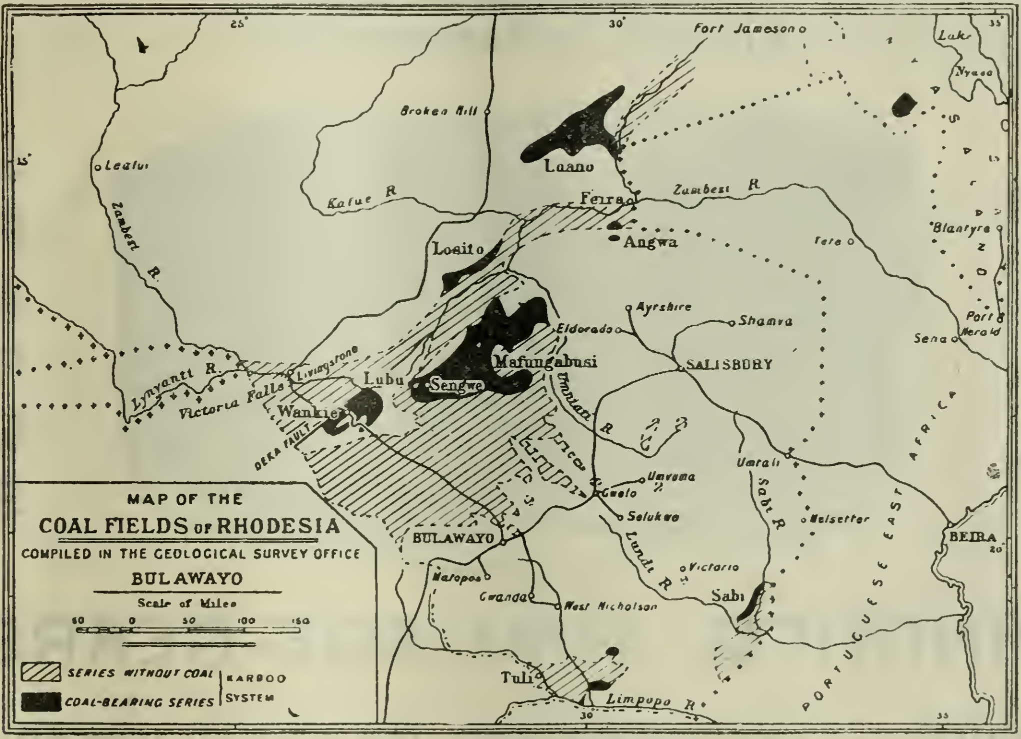
CHARACTERISTICS OF THE COAL.

In this table the coal is segregated into four groups according to the desired classification of the Committee of the International Geological Congress. This classification is based on fuel ratio effects observed on burning, mean composition, calorific value, etc. The majority of the coals of Rhodesia, like those of South Africa, contain a large percentage of ash, which is high in comparison with the coals of Great Britain. However, the Wankie and one of the Tuli coals only contains 8 to 13 per cent., which compares favourably with with the usual 15-20 per cent. in South African coals. For ordinary purposes the classification may be given the following interpretation:—A1, Anthracite. A2, Semi-anthracite. B1, Semi-bituminous. B2, Bituminous. Generally coking. Useful steam and house coals. B3, C, Highly bituminous, gas coal. D1, D2, Brown coals and lignite. Mr. Maufe says the Rhodesian coal fields are shallow, and it is unlikely that any coal exists below 4,000 feet from surface, a depth which is generally accepted as a limit to the profitable working of coal. The only really concealed coalfield is the one probably existing beneath the Victoria Falls basalts.

"The coal-bearing beds of Rhodesia,' writes the Director,' "belong to the Karroo formation, which is widely distributed in the low-lying basins of the Limpopo and Zambezi rivers and their affluents. The largest area of Karroo rocks occupies the middle course of the Zambesi, and stretches southward towards the Zambesi-Limpopo watershed, several outliers being found on the divide itself. Within this area are the Wankie, Lubu, Sengwe, and Mafungabusi coalfields; and on its north-eastern extension down the Zambesi valley the Angwa field. North of the last-named is the Luano coalfield in Northern Rhodesia. To the south in the Limpopo valley are the three small fields of Umsingwani, Singwesi, and Massabi in the Tuli district, and to the south-east the Sabi coalfield in the angle between the Sabi and Lundi rivers. In most districts the Karroo beds rest in great discordance upon the granites and schists belonging to the ancient metamorphic system. In one or two districts there is perhaps an intervening sedimentary system consisting of hard shales and grits. which has been correlated by Mr. Mennell with the Waterberg system of the Transvaal. The Karroo rocks have been classified by Mr. A. J. C. Molyneux (5) in the manner shown in the second column of the accompanying table. In the Wankie coalfield slightly different divisions were found necessary by Mr. Lightfoot, and it is not certain how his lowest five groups compare in detail with the Matobola beds and Basal beds of Mr. Molyneux. The correlation suggested in the table with the corresponding beds in the Transvaal and Cape Provinces follows that commonly received, with the exception that the Escarpment Grits are sometimes classed as Beaufort. There is at present no palaeontological evidence to decide whether the grits are of Beaufort or Stormberg age."

In our next issue we propose dealing with the contributions of Messrs. Lightfoot and Thomson on the Wankie area.

Rhodesia.		Transvaal.	Cape Colony.
Wankie Coalfield.	Other districts (after Molyneux.)		
Batoka Basalts	Batoka. Tuli & Sabi Basalts ..	Bushveld Volcanic Series ..	Stormberg Volcanics
Forest Sandstones	Forest (& Samkoto) Sandstones	Bushveld Sandstone Series ..	Stormberg Beds
Escarpment Grits	Escarpment Grits		
Madumabisa Shales	Upper Matobola Beds		Beaufort Series
Upper Wankie Sandstones ..	(Bussé Series)		
Fireclay			
Black Shale & Coal Group ..	Lower Matobola Beds	High Veld Coal Measures ..	Ecca Series
Lower Wankie Sandstones ..	Basal Beds & Conglomerates ..	Dwyka Conglomerate	Dwyka Conglomerate



Rhodesia's Coal Fields.

Mine Wages and Stores.

From the returns of the Mines Department we learn that the following figures show the amounts paid in salaries and wages to white employees for the year over the whole of the Union: Gold mining industry, £7,922,645; diamond mines, £1,383,057; coal mines, £413,259; base mineral mines, £180,788; lime and flint works, £13,741; grand total, £9,913,490. The amount spent on the mines of the Witwatersrand was £7,537,101, and this was distributed as follows: Technical staff, £742,820; clerical staff, £367,110; other white employees, £6,427,171. The total wages earned by Asiatics and other coloured persons employed on mines during 1913 was £8,027,541. Of this Asiatics earned £117,038 and Asiatic females £586; while natives and others got £7,907,025, and native females £2,892. Of the total the Witwatersrand mines paid £5,304,387 to natives or an average wage of 52s. per month, and to Asiatics £36,274, or an average of 120s. 11d. per month. The following are the total wages paid to Asiatics and natives in the mines for the whole of the Union for the last three years: 1911, £8,181,095; 1912, £8,505,693; 1913, £8,027,541. As for stores, the total amount spent on stores by the mining industry in the Union during last year was £13,362,905. Of this amount the gold industry contributed £10,633,152, and, of the ten millions, the Rand was responsible for the spending of £10,128,800. Diamond mines were responsible for a million and a half. The amount paid out during the year for the whole of the Union was higher than in 1912, though lower than that of 1911. Thus, the following is the total expenditure on stores by the mines in the whole of the Union in 1911 and since: 1911, £14,071,108; 1912, £12,660,047; 1913, £13,362,905. At the same time only £582,483 were direct imports. Last year the direct imports for the Union were £415,793. In 1911 they were £496,077. The Rand's share of direct imports on this basis last year was only £13,942.

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Engineering Notes and News.

Electricity in Mines.

Mr. Elsdon-Dew presided at the general meeting of the South African Institute of Electrical Engineers last week, when the Past-President (Mr. J. W. Kirkland) delivered his valedictory address. Mr. Kirkland's remarks largely took the form of a summary of what he saw and heard in an engineering way when he was recently in the United States. He mentioned that the use of electricity in mining operations was becoming almost universal. There was an exception in the rock-drill, for which compressed air remained practically without rival. Even in coal mining, in which for generations the cost of fuel had been considered to be nil, the use of electricity was greatly being extended. The electrical propulsion of ships was becoming a matter of considerable engineering interest, and it appeared not at all improbable that the next few years would see a great many ocean-going steamers propelled by electric motors which received their power from high-speed turbo-generators.

Dont's for Detonator Users.

The following instructions of the E. I. du Pont de Nemours Power Company are published by "Coal Age," 11th October, 1913:—

1. Don't forget the nature of blasting caps, but remember that with proper care they can be handled with comparative safety.
2. Don't smoke while you are handling blasting caps, and always keep them away from lights.
3. Don't shoot into blasting caps, whether electric or other, with a rifle or pistol.
4. Don't handle or store blasting caps in or near a residence.
5. Don't allow blasting caps to be stored where children or irresponsible persons can get at them. Keep them under lock and key.
6. Don't store or transport blasting caps of any kind with high explosives.
7. Don't keep blasting caps, electric or other, in a damp place.
8. Don't carry them in your pocket.
9. Don't tap or otherwise investigate them.
10. Don't try to pull the wires from an electric blasting cap. The wires should not be jerked or roughly handled.
11. Don't attempt to take blasting caps from the box by inserting a wire nail or other sharp instrument.
12. Don't allow priming (the placing of a blasting cap in dynamite) to be done in a thawing house.
13. Don't fasten the blasting cap to the fuse with the teeth or with a knife. Use a cap crimper made for that special purpose.
14. Don't handle electric blasting caps during the immediate approach or progress of a thunder storm.
15. Don't attempt to use the electric blasting caps with the regular insulation for extremely wet work. For that purpose, use waterproof fuses.
16. Don't use old broken leading or connecting wire for electric blasting caps. A new supply will not cost much and will pay for itself many times over.

The best "Reef Traveller" is the *South African Mining Journal.*

Welch Hoisting Engine Controller.

A representative audience of mining men, including Mr. C. F. Kelley, vice-president of the Anaconda Copper Mining Company; John Gillie, superintendent of the same company; Thomas Mitchell, head of the Leonard group of mines; State Mine Inspector William Orem; Master Mechanic Lilly, and a number of others, stood by the engine of the Mountain View Mine one day recently, and saw a simple device, invented by a former Butte man, control the speed of the engine so perfectly that a runaway accident, which might result fatally otherwise, would have been impossible. Mr. C. R. Welch is the inventor, and the name of the device is the Welch hoisting engine controller. The safety device was invented by Mr. Welch five years ago, but he has added improvements which he has patented from time to time. The Mountain View Mine engine weighs more than 300 tons and is one of the fastest in the United States. The engineer, Dan Vivian, at the demonstration, tried to make the engine run away by starting one side with the cage descending. He would leave the throttle open, giving the engine full leeway, and, as the engine gained excessive speed, the safety applied the brakes and stopped the engine automatically. He also put the throttle wide open with the cage approaching the surface, and the safety applied the brakes, stopping before reaching the danger zone. The demonstration showed that a runaway at either end of the shaft will be impossible with the safety controller attached. Mr. Welch, who is an old mining man and engineer, equipped several plants in Butte with his device five years ago. The device was crude then, but the Anaconda Comuany officials say it has prevented such accidents with the engines to which the safeties are attached. With the improvement added, the device becomes a perfect working apparatus, and it is said practically all the engines of the Butte camp will adopt it. Mr. Welch has placed 400 safety controllers in the different mining States.

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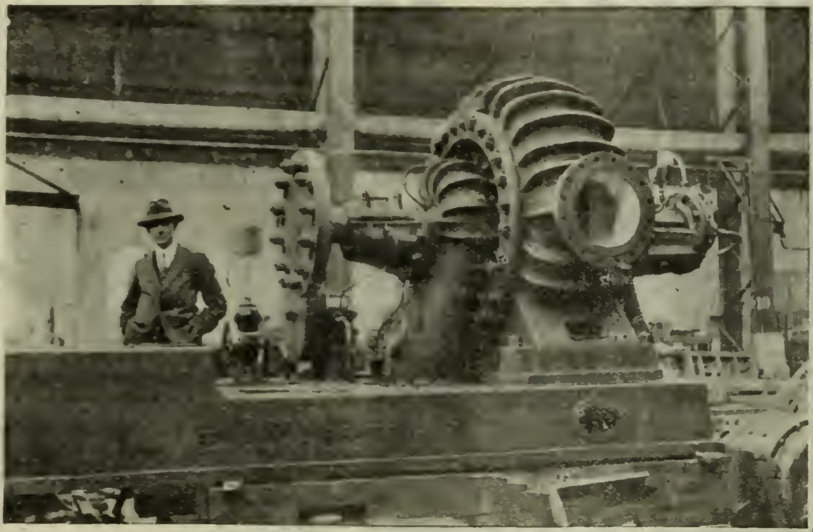

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A Big Milling Enterprise.

One of the most up-to-date flour mills in the world has been erected by Messrs. R. & J. Fleming at the corner of Pritchard and Kerk Streets. Early in 1912 this firm was formed into and registered at a private company for the purpose of adding an up-to-date flour mill to its existing maize and fanko plant. With this object in view, Mr. A. C. Hershensohn, the chairman of the company, proceeded to England in 1912, and with the co-operation of Mr. A. D. Bacon, formerly general manager of the Randfontein Central Gold Mining Company, Ltd., and his co-director, the flour milling plant was selected. The question was gone into very carefully, outside expert advice being obtained, and several months were spent in inspecting some of the most modern flour milling plants then in existence, and also the works where such plants were manufactured. The final conclusion arrived at was that the plant which has now been erected was the best that could possibly be obtained, and definite arrangements were subsequently entered into with Messrs. Thomas Robinson & Sons, Ltd., of Rochdale, England. Subsequently the new building, five storeys high, was erected to receive the new machinery, and on Friday last the new plant was set in motion. The plant has a capacity of ten sacks of 280 lbs. each of flour per hour, apart from bran and other wheaten products, and in flour milling parlance is known as a ton sack plant. This capacity has at the preliminary test been considerably exceeded, and at present selling prices of flour and other wheaten products it is capable of producing such to a value of some £200,000 annually. The buildings have been erected from plans prepared by Messrs. Thomas Robinson & Sons, Ltd., the erection being supervised locally by Mr. Mitchelson. The local contractor for the buildings was Mr. A. L. Reed, and his work is deserving of the highest praise.

* * * *

Ermelo Light and Water Scheme.

With regard to the public water and electric lighting schemes for Ermelo, tenders for the supply of the material for the various work in connection therewith were called for, and what are considered the most suitable have been accepted. The testing of the water-yielding capacities of the different boreholes is in progress. The following are the particulars of the tenders received in connection with the electric lighting and water schemes: For the machinery and pumping plant, poles and overhead system, Hubert Davies & Co., £7,750; S. Sykes and Co., £7,314; Siemens, Ltd., £7,048; German General Electric Co., £6,305; British General Electric Co., £5,961. The last named was recommended for acceptance. For pipes only the tenders were as follow: Reunert and Lenz, £4,246; Orenstein Arthur Koppel, £3,599; South African General Electric Co., £3,580; Stewart and Lloyds, £3,535; Baerecke and Kleudgen, £3,298; Scottish Tube Co., £3,245; John Russell and Co., £3,183; Andrew and Thienhaus, £3,000; and H. Incledon and Co., £2,984. The tender of Messrs. Andrew and Thienhaus was accepted. Tenders received for special castings, valves and fittings were as follow: South African General Electric Co., £870; Reunert and Lenz, £754; H. Incledon and Co., £732; Scottish Tube Co., £649; Baerecke and Kleudgen, £592; Stewart and Lloyds, £585; Orenstein Arthur Koppel, £552. The tender of Messrs. Stewart and Lloyds was accepted. Alternate tenders, which include locomobile engine three-throw pumps, poles and crossarms, manufactured by Stewart and Lloyds, were submitted from the following firms: S. Sykes and Co., £6,665; German General Electric Co., £6,605; the British General Electric Co., £6,544. The tender of the British General Electric Co. was accepted. A tender of Messrs. Stewart and Lloyds for the supply of Kennedy meters for the sum of £123 was also accepted. The following tenders for machinery and pumping plant only were received: Reunert and Lenz, £4,508; Harvey and Co., £4,351; and the United Engineering Co., £3,924. The cost of the material and plant comes out something like £2,000 under the engineer's estimate, whilst the total cost of the combined water and electric lighting schemes is anticipated to be in the neighbourhood of £18,000, and the two schemes are expected to be completed and ready for use about October next.

New Patents.

38. Thomas Pettigrew.—Improved circuit arrangement for telephone exchanges with automatic selecting devices.
39. Thomas Pettigrew.—Improved circuit arrangement for telephone exchanges with selecting devices.
40. Adamson George Wild.—Improvements in and relating to steam heaters for railway vehicles.
41. Alexander John Arbuckle.—Improvements in apparatus for separating liquid from crushed ore products and for other similar pur poses.
42. Nicholas John Kempthorne.—An improved design of two stroke internal combustion engine.
43. David Brodie and William Allan Thomas.—An improved automatic pressure alarm for pneumatic tyres.
44. Edward Brice Killen.—Improvements in or relating to wheels.
45. Kenneth Bingham Quinan.—Improvements in explosives.
46. Mathias Pier.—Improvements in or relating to synthetic processes for the production of ammonia from its elements.
47. Samuel William Bradbury.—Antifriction ball bearings.
48. Frank Hill.—Improvements in rollers for mine shafts, haulage tracks and the like for supporting hoisting, hauling or other ropes or cables.
49. Martin Deacon and William Gore.—Improvements in or relating to apparatus for filtering water and other liquids.
50. Joseph Patrick Cunniff.—Safety clutch for vertical shafts.
51. John Christian Reul, Friederich Ludwig Emil Kunst and Wilhelm Hugo Kunst.—An improvement relating to ladies' and gentlemen's neckties.
52. William Wilson Humill.—Improved liquid fuel spraying devices.
53. Archer Henry Corbet.—Improvements in or relating to tents.
54. Arnold Heinrich Wegener.—Improvements in nut locks.

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of February, 1914, is as follows:—Reef: Mill: Gold won (fine gold), 315 ozs. 13 dwts. 0 grs.; tons crushed, 976; value £1,325 13s. 11d. Concentrates (estimated): Gold (fine gold), 7 ozs. 17 dwts. 0 grs.; tons, 3·3; value, £33 7s. 3d. Cyanide: Gold recovered (fine gold), 7 ozs. 1 dwt. 10 grs.; tons treated, 36; value, £29 13s. 8d.; Alluvial: Gold recovered (fine gold), 831 ozs. 16 dwts. 14 grs.; cubic metres treated, 60,000; value, £3,493 12s. 9d.; also won from ground treated in construction basin in January and beginning of February, 82 ozs. 2 dwts. 14 grs.; value £344 18s. 4d.

" Safety First " Devices.

At the Mining Exhibition from 19th to 29th May, the Rand Mutual Assurance Co., Ltd., are offering the following prizes and medals:—

(a) 1st, £25 and Silver Medal; 2nd, £15 and Bronze Medal; 3rd, £10, for: three best **Safety Devices** or **Methods of Procedure**, the bona-fide idea of exhibitor, not open to mercantile firms or selling agents.
(b) 1st, Silver Medal; 2nd, Bronze Medal, for: two best exhibits of **Safety Devices and Appliances** by Mercantile firms or agents prepared to supply same.
(c) Prize £10 cash, for best type of **Enclosed Lamp** exhibited, suitable for use in metalliferous mines, whilst handling explosives. Cheapness and simplicity of construction are material considerations.

Full particulars as to entry forms and conditions from:
FRED. ROWLAND,
9, S.A. School of Mines & Technology Building.
ELOFF STREET, JOHANNESBURG.
P.O. Box 1183. Telephone No. 1404.

TELEPHONE 3410. P.O. BOX 671.
PERCY RANSOME,
MECHANICAL DRAUGHTSMAN,
BLUE PRINTING A SPECIALITY.
59, MEISCHKE'S BUILDINGS,
(c/o MARKET - HARRISON STREETS). JOHANNESBURG.

THE WEEK IN THE SHAREMARKET.

Firmer Towards the Close—Political Uncertainty Still Hinders Activity.

The week has been singularly uneventful in the Sharemarket, the political crisis in England further restraining activity. Paris has apparently been frightened at the possibility of English differences in the Cabinet, and little support for Rand stocks has been forthcoming from that quarter. London critics describe our market as unfashionable at the present moment, Canada and Russia now absorbing all interest. Rhodesia has also been more to the fore lately owing to the good accounts from the Shamva and Cam and Motor. The former is said to be yielding a better grade of ore and to be working at a lower cost than expected. The local syndicate market has relapsed into quietness after the Harrisdale "boomlet." Pilandsbergs seem at the end of their tether, and for the moment there is no other claimant for popular favour.

*   *   *   *

	Fri. 20th.	Sat. 21st.	Mon. 23rd.	Tues. 24th.	Wed. 25th.	Thur. 26th.
Adair-Ushers	0 5*	0 5*	0 5*	0 5*	—	0 5*
African Farms	13 0*	13 0*	12 9*	12 11*	13 6	13 6*
Apex Mines	18 0*	18 6†	18 0*	17 0*	17 9*	17 6*
Bantjes Consolidated	13 6*	13 0*	13 0*	13 6*	13 6*	13 6*
Benoni Consolidated	—	—	—	—	—	1 7*
Blaauwboschs	90 †	—	—	—	—	—
Brakpan Mines	—	—	—	43 6*	44 0*	45 0*
Breyten Collieries	—	29 0*	29 0*	29 0*	—	—
British S.A.	—	—	17 3*	—	—	18 6*
Bushveld Tins	0 6*	0 7*	0 6*	—	0 7	0 6*
Cassel Coals	13 6*	13 6*	13 0*	13 6*	13 6*	—
City and Subs.	46 0*	45 0*	46 0	45 9	46 0*	46 6*
City Deeps	57 9	57 0*	57 0*	56 6*	58 0*	57 6*
Cloverfield Mines	4 3*	4 0*	—	4 3	4 6	4 3*
Clydesdale Collieries	9 0*	9 0*	9 0*	—	9 0*	9 0*
Concrete Construction	2 3*	—	—	—	—	—
Con. Investments	—	20 0†	—	—	—	—
Con. Langlaagtes	29 0*	—	—	28 9*	29 3*	29 3*
Con. Main Reefs	17 3*	17 0*	17 0*	17 3	17 3*	17 3*
Con. Mines Selection	8 6*	8 6*	8 3*	—	8 3*	—
Coronation Colls.	—	—	—	—	—	22 0*
Coronation Freeholds	0 6†	0 5†	0 3*	0 4*	0 4*	0 4*
Coronation Synd.	—	—	3 0*	—	—	3 4*
Crown Diamonds	8 0*	—	8 0	7 9*	7 9	7 9*
Crown Mines Deb.	—	£98*	£98*	£98*	—	£98*
East Rand Centrals	2 0*	2 0*	—	2 0*	—	2 2*
East Rand Coals	1 7	1 7*	1 6*	1 6*	1 6*	1 6*
East Rand Deeps	1 6*	1 4*	1 5*	1 5*	1 5*	1 5*
East Rand Props.	36 9*	35 0*	35 0*	35 6*	37 0*	37 6*
East Rand Deb.	£83½*	£86†	£85†	—	£83½	£85†
Eastern Golds	1 0*	1 0*	1 0*	1 0*	—	1 0*
Frank Smiths	5 4*	5 5*	5 5*	5 6*	5 6*	5 6*
Geduld Props.	22 9*	22 6*	22 0*	22 6*	23 6	23 6*
Geldenhuis Deeps	26 0†	25 0†	—	26 0†	26 0†	20 0*
Glencoe Collieries	—	6 6*	—	—	6 6*	6 6*
Glynn's Lydenburgs	—	10 0*	10 6*	10 0*	10 0*	—
Govt. Areas	18 9	18 3*	18 3*	18 6*	19 0	18 9*
Joh. Bd. of Ex.	—	—	—	23 6*	—	—
Jupiters	4 6*	5 0†	—	—	—	—
Klerksdorp Props.	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Knight Centrals	9 4*	9 4*	9 4	9 5	9 9	9 9
Lace Props.	2 9*	—	2 6*	2 8*	2 10	2 10*
Luipaardsvlei Est.	9 9*	9 9*	—	—	10 0*	10 0*
Lyd. Gold Farms	2 9*	2 9*	2 9*	—	—	2 9*
Main Reef Wests	7 6*	7 6†	7 9†	6 9*	6 9*	6 6*
Meyer and Charltons	101 3*	100 0*	—	101 3*	—	105 0*
Middelvlei Est.	1 0*	1 3†	1 0*	1 0*	—	1 0*
Modder B.'s	—	—	—	—	79 0*	—
Modder Deeps	42 0	41 0*	41 0	41 0*	42 3	42 0*
New Boksburgs	0 9*	0 9*	0 9*	0 9*	0 11	0 10*
New Era Cons.	—	5 3*	5 0*	5 6*	5 6*	—
New Geduld Deeps	1 10*	1 9*	1 10	1 10*	—	1 10*
New Kleinfonteins	22 6	21 6*	21 9*	21 9*	22 9	22 9*
New Modderfontn.	240 0*	—	—	—	—	240 0*
New Rietfonteins	—	2 6†	2 6†	2 6†	—	2 6
New Unifieds	—	—	15 0†	15 0†	15 0†	—
Orange Diamonds	—	1 6*	1 7†	1 7†	1 7†	1 5*
Pigg's Peak	—	10 0*	—	10 0*	10 0*	10 0*
Pretoria Cements	47 0†	—	47 0†	47 0†	46 0†	46 0†
Princess	—	—	—	4 3	5 6†	5 6†
Rand Klips	2 0*	2 1*	2 0*	2 1	2 2*	2 2*
Rand Nucleus	1 9†	1 6*	1 7*	1 7*	1 7*	1 7*
Randfontein Deeps	3 0*	3 0*	3 0*	3 3	3 4*	3 3*
Randfontein Est.	22 6†	20 3*	20 6*	21 6	21 6*	21 9*
Robinson Deeps	29 0†	—	25 0*	—	—	—
Rooibergs	24 6*	25 0	24 0*	24 6*	—	25 0*

*Buyers. †Sellers.

	Fri. 20th.	Sat. 21st.	Mon. 23rd.	Tues. 24th.	Wed. 25th.	Thur. 26th.
Roodepoort Uniteds	—	—	—	2 9*	4 0*	—
Ryan Nigels	—	--	—	3 3†	—	2 9*
Shebas	5 0*	5 0*	5 0*	—	4 9*	4 9*
Simmer Deeps	2 0*	2 0†	2 0†	2 0†	2 0†	2 0†
S.A. Breweries	—	41 0†	41 0†	41 0†	39 6*	41 0†
S.A. Diamonds	—	30 0*	30 0*	—	—	—
S.A. Lands	2 10*	2 9*	2 10	2 9*	2 11	2 10*
Springs Mines	—	—	14 0	—	—	—
Sub Nigels	11 0*	10 9*	10 6*	10 6*	11 0*	10 9*
Trans. Coal Trusts	28 0*	7 0*	—	27 0*	27 6	27 0*
Trans. Con. Lands	17 6*	—	—	22 6†	—	—
Trans. G.M. Est.	41 0*	41 0*	41 3*	41 6*	41 6*	41 6*
Tudors	—	1 0*	—	—	—	—
Van Dyks	1 0*	—	1 0*	1 0*	—	1 0*
Van Ryns	41 6	41 0	40 9	41 6*	41 9	41 9
Village Deeps	—	34 0*	33 6*	33 6*	34 0*	34 0*
Vogel Con. Deeps	1 0*	—	1 0*	1 0*	—	1 0*
Witbank Collieries	45 6†	—	45 0†	—	42 9*	43 6*
Witwatersrands	66 0*	—	66 0*	66 0*	66 0*	66 6*
Wit. Deeps	50 0*	50 0	48 6*	49 06	50 0*	50 3*
Wolhuters	14 6*	14 9	14 6*	14 6*	14 9*	15 0*
Zaaiplaats Tins	27 6*	27 3*	27 0*	26 3*	26 3*	27 0

*Buyers. †Sellers.

Transvaal G.M. Estates.

An interim dividend of 17½ per cent. (3s. 6d. per share) has been declared by the Transvaal Gold Mining Estates for the half-year ending 31st March, 1914, payable to all shareholders registered in the books of the company at the close of business on Tuesday, the 31st day of March, 1914.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

March 31.—Cassel Coal Co. (annual).
May 6.—Van Dyk Proprietary; Lancaster West; Tudor; Modder Deep Levels; Geduld Proprietary; Princess Estate; May Consolidated (annual).
May 20.—Apex Mines, New Kleinfontein (Annual).
May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).
June 23.—Transvaal Consolidated Lands (annual).

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

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Finance, Commerce, and Industries.

Explosives Manufacture.

In the House of Assembly last week, Mr. H. W. Sampson (Commissioner Street) asked the Minister of Mines and Industries: (1) What number of cases of explosives were manufactured during the year 1913 at the respective dynamite factories in the Cape, Natal and Transvaal Provinces; and (2) what were the number of white and coloured persons employed at each of the works? The Minister of Mines and Industries replied: (1) The number of cases of explosives manufactured during the year 1913 was as follows: Cape, 407,097; Natal, 230,080; Transvaal, 272,605; total, 909,783. (2) The average number of white and coloured persons employed during 1913 was as follows: White: Cape, 401; Natal, 220; Transvaal, 245. Coloured: Cape, 554; Natal, 700; Transvaal, 669.

* * * *

Union Building Activity.

Nine municipalities in the Transvaal Province during the month of February approved plans having an estimated value of £71,874, as against £83,676 for the month of January, showing a decrease of £11,802. Nine municipalities in the Cape Province approved plans having an estimated value of £20,485 15s. Durban Municipality passed plans having an estimated value of £24,509, and Bloemfontein passed plans having an estimated value of £3,703.

* * * *

Export Trade in 1913.

Recently we referred to the chief import and export figures of South African trade in 1913. It may be of interest to examine the export figures further. That the striking increase in exports shown in 1912 has not been maintained at the same rate is due in some small measure to the drought of 1913, but in a much larger degree to the disturbed condition of the Rand in July. In 1912 the exports of raw gold were 3½ million pounds in excess of those of 1911; in 1913 they fell back nearly one million. And as raw gold still comprises more than one-half of the exports of the Union, it is scarcely surprising, in view of this decrease in the shipments of gold, that the general advance in trade has not been maintained. The other staple exports all manifest continued improvement. In the case of diamonds, second in importance only to gold in the export trade of the country, there was a big increase; the total for the year was £12,016,525, as compared with £9,153,316 in 1912. The figures for other chief exports are as follows, the totals for 1912 being given in brackets for purposes of comparison: Wool £5,719,288 (£4,780,594), increase £938,694; ostrich feathers, £2,953,587 (£2,609,638), increase £343,949; hides and skins, £2,017,863 (£1,691,014), increase £326,849. The drought of 1912 may be assumed to be responsible for decreases amounting to over £400,000 in the exportation of corn, grain, and meal (mostly maize), and possibly for a drop of £90,000, or 10 per cent., in Angora hair, though the advance in wool production was more than maintained in spite of the drought.

* * * *

Wheat Resources of South Africa.

The following is a summary of the interesting evidence given by Mr. J. M. Stephen, managing director of the South African Milling Company, before the Dominions Trade Commission:—

In 1911 we grew 6,034,400 bushels of wheat, sufficient for about six months' consumption. In 1912 our production was 7,705,200 bushels, nearly equal to seven and a half months' requirements. In 1913, owing to severe drought in the Orange Free State and the Northern parts of the Union, there was a considerable setback, necessitating importations on a much larger scale than usual. Granted normal conditions, we might expect to balance consumption with production in about six or seven years if our policy of the steady extension of railways is not arrested. The developments of the Zak and Great Fish Rivers, due to the extension of the Carnarvon-Calvinia Railway, will probably supply sufficient wheat to cover one-third of our deficiency, the remaining two-thirds may be looked for from increased production in the cereal districts of the Cape Province, from the Transvaal, and from the wheat lands in the Orange Free State and Basutoland. If we grow enough to supply our own requirements it is as much as we can hope to effect. I do not anticipate that we shall ever be in a position to export wheat; if we do, it will be in but very moderate quantities. The increase of our production of wheat is something that deserves more attention from our governing bodies than it has hitherto received. Apart from economic considerations, I am of opinion that one of the greatest services we can render the Mother Country is the making of South Africa absolutely self-reliant in the matter of its primary foodstuffs, so as to free the authorities in Great Britain from the anxiety and cost necessary under present conditions to protect our food supplies in transit by sea in the event of serious European complications. Our imports of wheat and flour are mainly from Australia. Canada supplies a fair quantity, while imports from South America have fallen off considerably. New Zealand used to send a share, but owing to various causes she is no longer considered a contributing factor. A very grave complaint South African importers of wheat have to make is the serious shortage in weight of wheat delivered, the instances being rare indeed that delivery and invoice weights approach each other. Certificates both as to quality and quantity apparently afford but little protection to the South African miller, who is thus seriously handicapped in his competition against imported flour. Australia is the worst offender in this respect; Canada is rather better, while New Zealand weights may be relied upon. The attention of the Australian authorities ought to be drawn to careless methods which occasion much loss to some of the customers of the Commonwealth, and certainly lend themselves to considerable improvement.

East Rand Proprietary Mines.

The following information has been cabled to the London office of the E.R.P.M.: "The Main Reef series has been struck in the 28th level crosscut N., 225 feet from the Hercules vertical shaft, assaying 9·6 dwts. over 129 inches."

"EYRE" BEARING METAL.

Specially recommended for Bearings of all sorts, Crushers, Locomotive Axle Boxes, etc., etc.

Very low first cost, combined with low coefficient of friction and high melting point—The two most essential factors.

Uniform Quality Guaranteed. *Stocks always on hand.*

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WHAT THE SOUTH AFRICAN MINES BUY.

Official Statistics of Stores Consumed by theIndustry in 1913—Total Purchases £13,362,905—Substantial Increase on 1912.

The stores consumed by the mines in the Union of South Africa for the year 1913 are given below. The first two tables deal with the Transvaal only—the third with the whole Union.

Classification.	Totals for the Transvaal.	
	Weight or Quantity.	Value. £
Bags (value)	—	21,649
Belting (value)	—	114,880
Bolts, Nuts, Washers and Rivets (lbs.)	3,721,963	44,394
Brattice Cloth (value)	—	1,709
Bricks (value)	—	27,844
Brushware (value)	—	10,407
Candles (lbs.)	11,935,054	214,319
Carbide (lbs.)	5,016,778	53,835
Castings—		
(a) Brass (lbs.)	561,257	31,742
(b) Bags (lbs.)	6,988,805	88,101
Cement—		
(a) Casks (No.)	7,641	10,747
(b) Bags (No.	99,988	42,057
Charcoal (value)	—	19,096
Chemicals and Assay Requisites (value)	—	172,316
Coal-cutting Machines (number)	89	5,200
Coal-cutting Machines Spares (value)	—	4,789
Coal—		
(a) Smithy (tons)	24,772	31,252
(b) Steam (tons)	2,088,902	1,024,410
(c) Office (tons)	70,566	27,615
Coke—		
(a) Imported (tons)	867	5,727
(b) Local (tons)	1,632	5,111
Compressed Air (purchased) (value)	—	239,774
Cyanide (lbs.)	11,096,812	463,561
Disinfectants (value)	—	18,737
Electrical Machinery (as detailed in statement below) (value)	—	335,904
Electric Machinery Spares (value)	—	82,104
Electric Power and Light (purchased) (value)	—	888,814
Explosives—		
(a) Blasting Gelatine (cases)	453,128	1,031,763
(b) Gelignite and Gelatine Dynamite (cases)	214,566	379,253
(c) Dynamite No. 1 (cases)	3,976	4,879
(d) Dynamite No. 2 and Ligdyn (cases)	68,720	83,951
(e) Other explosives (cases)	2,147	3,717
(f) Detonators (boxes)	311,861	39,128
(g) Electric Detonators (or Electric Fuses) (No.)	473,456	2,765
(h) Safety Fuse (coils)	8,398,611	144,789
(i) Tyisa Sticks (value)	—	15,325
Fencing and Wire Netting (value)	—	3,397
Fodder for stables—		
Bran, Chaff, Mealies, Forage, etc (value)	—	35,778
Foods, etc. (for coloured labourers)—		
(a) Beans and Rice (lbs.)	10,989,236	85,260
(b) Meal (Mealie, Kaffir Corn, etc.) (bags)	606,297	400,068
(c) Malt and Cereals for Beer (value)	—	24,845
(d) Meat (lbs.)	31,237,392	468,123
(e) Salt (bags)	6,999	2,337
(f) Groceries, Coffee, Sugar, Molasses, etc. (value)	—	36,119
(g) Sundry Foods, including Bread (value)	—	179,661
(g) Vegetables (value)	—	56,975
(i) Medicines, etc. (value)	—	32,933
(j) Clothing (value)	—	19,071
Hosing (Steam, Suction and Rock-drill) (value)	—	73,296
Hand Tools (Picks, Shovels, Hammers, etc.) (value)	—	79,334
Iron—		
(a) Bar and Angle (lbs.)	8,096,180	68.659
(b) Galvanised (feet)	1,533.612	32.351
(c) Sheet (lbs.)	210,077	2,048
(d) Pig (lbs.)	478,617	2,615
Lamps and Spares (value)	—	17,355
Lead—		
(a) Pig (lbs.)	204.268	2.205
(b) Sheet (lbs.)	38,253	602
Lime—		
(a) White (bags	482,919	119.869
(b) Blue (bags)	29,366	5,058
Lubricants—		
(a) Oils (gallons)	908,112	107.257
(b) Grease and Tallows (lbs.)	4,499,873	74,584
Machinery and Machine Tools (as detailed in statement below) (value)	—	568,192
Machinery Spares, other than specified (value)	—	253,846
Mercury (bottles)	3,013	24.919
Metals (Anti-friction) (lbs.)	256,254	22,154
Mill Screenings (value)	—	22,948
Motor-cars and Accessories (value)	—	13,546
Oils, other than lubricating (value)	—	2,828
Oilskin Suits (value)	—	9,694
Packing (lbs.)	406,188	40,315
Paint, Tar, Driers, etc. (value)	—	19,691
Paraffin (cases)	31,799	16,202
Petrol (cases)	10,781	9,861
Pipes and Pipe Fittings (value)	—	356,660
Rails, Crossings, Sleepers, etc. (value)	—	201,969
Rock-drills (number)	2,450	64,149
Rock-drill Spares (value)	—	163,100
Ropes—		
(a) Wire (value)	—	120,088
(c) Cotton and Manilla (lbs.)	350,939	12,478
Screenings, other than Mill (value)	—	5,813
Screws, Nails, etc. (value)	—	18,023
Shoes and Dies (lbs.)	14,966,423	135,516
Skips and Spares (value)	—	14,492
Stationery (value)	—	59,992
Steel—		
(a) Bar, Tool, Cast, etc. (lbs.)	2,342,129	27,934
(b) Sheet (lbs.)	12,126,582	89,748
(c) Hand-drill (lbs.)	4,783,287	65,083
(d) Rock-drill (lbs.)	6,482,469	97,646
(e) Other (lbs.)	258,237	2,883
Timber—		
(a) Building material (ceilings, floorings, doors, etc.) (value)	—	31,432
(b) Oregon, Pitch Pine, etc. (cub. ft.)	1,220,856	255,951
(c) Mining Poles and Round Lagging (value)	—	299,270
(d) Deals (feet)	4,537,993	136,892
(e) Fuel (value)	—	13,626
Tube mill requisites—		
(a) Pebbles and Flints (value)	—	4,145
(b) Liners (sets)	389	45,551
(c) Other Requisites (value)	—	15,408
Trucks and Spares (value)	—	111,141
Waste (lbs.)	764,538	15,070
Water (purchased) (value)	—	124,311
Zinc and Zinc Discs (lbs.)	9.362,059	156,268
Sundry Articles not specified above (value)	—	250,420
Total value	—	11,520,718

Detailed statement of "Machinery and Tools" and "Electrical Machinery" for the Transvaal:—

Machinery and Machine Tools.	£
Water Purifiers	474
Boiler Plant, other than that of Locomotives, Traction Engines, or Steam Wagons	55,336
Headgear	12,834
Steam Engines—	
(a) For Winding	22,883
(b) For Pumping, including Pumps if directly driven	635
(c) For Compressors, including Compressors	38,836
(d) For Generating Electricity	1,754
(e) For other purposes	1,249
Pumps—	
(a) Air-driven	5,673
(b) Driven indirectly by Steam	4,587
(c) Driven indirectly by Electric Motors	32,552
(d) Driven indirectly by Gas or Oil Engine	875
Steam Locomotives	6,548
Traction Engines	650
Steam Lorries	—
Motor Wagons—	
(a) Electric	—
(b) Oil	1,653
Gas or Oil Engines	17,723
Mechanical Lifts and Elevators other than Belt Conveyors and Elevators	7,929
Belt Conveyors and Elevators	19,533
Other Mechanical Haulage	7,813
Reduction Plant, excluding Engines and Consumable Stores, such as Shoes and Dies, Screenings, etc.	103,217
Washing Plant	12,883
Treatment Plant, including Furnaces	70,995
Workshop Plant, excluding Engines and Motors	26,944
Mine Ventilation Plant, excluding Engines, Compressors and Motors	3,443
Diamond Drills (property of company)	125
Miscellaneous Machinery not particularised above	111,048
Total Value (shown under the Heading "Machinery and Machine tools"—stores consumed)	568,192

Classification.	Totals Transvaal Mines.
Electrical Machinery, including Fittings for Power and Lighting.	
	£
Electrical Generators and Engines driving same if directly driven	51,584
Electric Hoists, including Motors	61,987
Electric Locomotives	415
Electric Motors driving Pumps, including Pumps if directly driven	35,732
Electric Motors not included above	37,626
Power Lines, Transformers, etc.	76,087
Electric Bells, Telephones, and other Fixtures	17,988
Miscellaneous Machinery not particularised above	54,485
Total Value (shown under the heading "Electrical Machinery"—Stores consumed)	335,904

The following table gives the total expenditure on mine stores in the Union for the year:

		Gold Mining Industry.	Diamond Mines.	Coal Mines.	Base Mineral Mines.	Lime and Flint Works.	Total.
		Value. £	Value. £	Value. £	Value. £	Value. £	Value £
Witwatersrand	£10,128,800						
Outside Witwatersrand	450,912						
Total Gold Mines	£10,579,712						
Reef Diggers	27,748						
Metallurgical and Tailings Works	21,653						
Transvaal		10,629,113	363,409	330,956	246,642	40,671	11,610,791
Cape Colony		104	814,657	8,774	147,451	444	971,430
Orange Free State		541	467,153	51,133	—	3,448	522,275
Natal Gold Mines	£266						
,, Reef Diggers	3,128						
Natal		3,394	—	252,393	1,411	1,211	258,409
Union of South Africa	£	10,633,152	1,645,219	643,256	395,504	45,774	13,362,905
Year 1911	£	11,714,755	1,450,127	544,782	305,830	55,614	14,071,108
Year 1912	£	10,311,940	1,466,151	523,025	307,135	51,796	12,660,047
Year 1913	£	10,633,152	1,645,219	643,256	395,504	45,774	13,362,905

Dominions Commission.

In giving evidence before the Dominions Commission at Capetown this week, Mr. Solomon, representing the British Manufacturers' Representatives' Association, urged a reduction in the present excessive cost of licences in this country for agents of foreign firms. They were officially described as representing "foreign" firms, and the present fee, £50 in the Cape Colony, was the highest in any country in the world, British or foreign. The Chairman advised that the subject should be brought to the attention of the British Trades Commissioner, who would doubtless be of some assistance in getting redress. Witness also complained of the preferential rate charged on the railways in the case of locally-made goods as against British manufactured articles in the same lines. Sir Jan Langerman asked if witness did not think it reasonable that the Government should foster colonial manufactures in this way. The reply was that as representing British firms they thought they were not being met fairly, seeing that this was a British colony and not a foreign country. Mr. W. J. Laite, general secretary of the South African Manufacturers' Association, gave evidence relating to local industries. He stated that whereas only a comparatively short period since there were few local industries of any importance, there was now estimated to be from 30 to 40 millions invested in industries in this country, which employed thousands of hands. Reliable and complete figures relating to these industries were unfortunately unobtainable, owing to the fact that the Government hitherto, although pressed to do so, had declined to carry out a thorough industrial census and to compile the necessary statistics. This was a most urgent matter, and ought to have immediate attention. Questioned as to the character of the labour employed, Mr. Laite stated that unskilled coloured labour was generally employed, and this was found very efficient. In a few trades, such as cabinet making, even semi-skilled work was now performed by coloured labour, but the real skilled work, in the true sense of the term, was still and always had been performed by whites, as the coloured man had not shown himself really adapted for the higher grades of work, where real skill and intelligence were necessary.

* * * *

Mining in the Belgian Congo.

Whilst it is asserted that the Belgian Congo is rich in minerals, it is generally admitted that, except for precious metals, the deposits cannot be satisfactorily worked until the establishment of better means of communication than those now in existence. Coalfields 247,000 acres in extent are stated, however, to have been discovered near Lake Tanganyika, near the exit of the Lukuga, and close to the line of the Grand Lacs Railway shortly to be completed. It is reported that the coal is in four beds nearly even with the ground. Iron has been discovered in the neighbourhood of Lake Kivu by prospectors of the Grand Lacs Railway Co. The Société Minère de la Tele, a subsidiary of the Société Internationale Forestière et Minière, is working gold mines in the Haute Tele. These mines produced about 2,025 ozs. gold during the year 1912. The gold mines at Kilo and Moto are being systematically worked. The Kilo mines yielded about 23,800 ozs. in 1912, and the production of gold at Moto for 1912 was about 7,844 ozs. The method employed is that of sluices, but the hydraulic process has also been tried. The Société Internationale Forestière et Minière has great concessions on the Aruwimi, Mayumbe and Kasai. Diamond deposits are said to have been discovered in the latter region, and the necessary machinery and personnel for working the deposits are now on the way.

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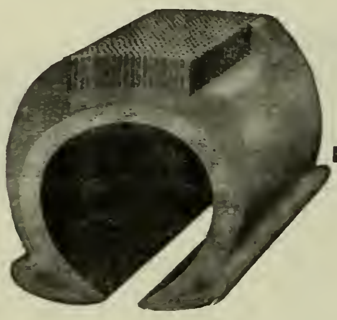

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AUTOMOBILE NOTES.

The twelfth annual dinner of the Royal Automobile Club of South Africa will be held at the Mount Nelson Hotel on Monday evening, the 6th April next. His Excellency Lord Gladstone, the President of the Club, will be present, and the gathering is likely to be the largest yet held.

* * * *

In spite of the increase and speeding-up of traffic, statistics show that street accidents are decreasing, and this plainly indicates that the public is being educated to accept the great change that has come about in modern traffic conditions. At the present time by far the greater proportion of accidents happen because pedestrians have not yet been able to appreciate the complete change that has taken place, and have thus not adapted themselves to it. That, however, is coming fast, and with increased opportunity for the regulation of traffic, which the proposed addition to the police force will provide, we may confidently look forward to an ever-decreasing total in the list of casualties.

* * * *

The Attorney-General of the State of Texas, consequent on an advance of from 16 to 18 cents in the wholesale price of petrol, has commenced an investigation with a view to bringing action against the companies concerned for violation of the anti-Trust laws. In the meantime it has been suggested that the State solve the question of high rates for oil products by entering the oil business, establishing a State refinery and using convicts in its operation.

* * * *

The wagons and horses used in connection with the work of the United States Senate were in the early part of the year sold by public auction at Washington, the work of that body being now carried out by the aid of three motor-cars.

* * * *

At the New York and Chicago motor show an interesting innovation in the illumination of cars was noticeable. It consists in the elimination of the side lamps; nearly 30 per cent. of the complete cars on view at the former city being fitted with an arrangement, in one shape or another, by which one pair of lamps were enabled to perform the duties of side lamps or head lamps as circumstances required.

* * * *

The announcement by the Technical Committee of the R.A.C., London, of their intention to organise a competition for two-stroke engines, will direct the attention of designers to that interesting mechanical product, and may lead to radical changes in motor-car manufacture by the results the competition may possibly bring about. Few who have watched the progress of the internal combustion engine doubt that a great future lies before the two-stroke engine, not the least of whose merits is its extreme simplicity.

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The Week's Company Meetings.

ROBINSON MEETING.

Mr. Boyd's Speech.

Attitude of Shareholders.

There was a good deal of interest in the adjourned special meeting of the Robinson Gold Mining Company, held this week in Corner House, inasmuch as Mr. H. C. Boyd the previous week promised to make a statement in reply to some of the criticism raised against the proposed purchase by the Crown Mines. Before Mr. Boyd had got beyond the first few sentences of his speech to-day, however, Mr. Lionel Cohen rose and asked whether it was necessary at the present for the chairman to make a statement, and would it not be more advisable to do so at the annual meeting. After all, he said, the shareholders who opposed the scheme were not present at the meeting to refute the statement.

Mr. B. Alexander associated himself with the remarks of Mr. Cohen, and did not see what good purpose could be served by making the statement. More particularly was this the case seeing that the gentleman who offered the criticism were not there to reply to any statement made by Mr. Boyd. The annual meeting was the proper place to make such statement. That was a special meeting called for a special purpose: the directors thought it advisable to discontinue the scheme. He submitted that that was the only business before the meeting.

After further discussion the Chairman thought it was a matter he might decide for himself whether he thought it advisable to make the statement or not. It was true there was no business before the meeting: but if he considered it advisable to make a statement to shareholders and they were willing to listen to it he thought he was proceeding in a proper manner.

After Mr. Hyman had said he hoped he would be allowed to speak on the conclusion of the chairman's speech,

Mr. Boyd said: In a circular addressed to shareholders, dated 7th ultimo, you were informed that, in view of the opposition shown by some of our shareholders to the proposed sale of this company's assets to the Crown Mines, Ltd., your directors had decided to abandon the provisional agreement into which they had entered. There is, therefore, no business before us for consideration to-day, but it appears advisable that this opportunity should be taken of refuting some of the statements which have been made in support of the opposition to the proposed sale. As has been made plain in the statements which have been issued to you, the basis of the proposed amalgamation was the comparative values of the two properties which had been arrived at by the consulting engineers of each company, the general manager and manager respectively of the companies being likewise fully consulted and having concurred in these valuations. The value in the case of our company was £2 19s. 6d. per share; that is for all assets (including the 40,000 Crown Mines shares) other than possible profit from a share of the proceeds from the sale of mining rights under bewaarplaatsen, a matter to which reference will be made later. The value of the Crown Mines shares, on the other hand, was found to be £7 10s. each. In both cases the amounts of the dividends declared per 31st of December, 1913, viz., 7s. per Robinson share and 5s. 6d. per Crown Mines share, were excluded from those valuations, which, it will be seen, represent as nearly as possible the relative value of two Crown Mines shares for five Robinson shares.

Two Classes of Opponents.

Among the opponents of the scheme there are two classes of shareholders to be considered, those who genuinely prefer to retain their security, with its high yield for a short period, rather than exchange it for shares from which the annual return would be materially less but receivable for a greatly extended period. For the opinion of these shareholders the directors have every respect and have no desire to attempt to override their wishes. On the other hand there are shareholders who have put forward or supported the most flagrant misstatements regarding the aims and intentions of the directors. Criticism of the scheme has been offered by one shareholder especially by circulars, letters to the Press and at informal meetings of shareholders held in London and Paris. It may be worth mentioning that this shareholder, whatever may be his position to-day, first appeared as a registered shareholder in June, 1913, when the possibility of such a scheme being brought forward had already been referred to in the Press. In a circular dated January 1st, 1914, this shareholder stated that, instead of receiving £5 per five Robinson shares per annum we should be receiving £1 2s. annually on the two Crown Mines shares which it was proposed we should receive for each five of our own shares, and that we should be exchanging five £5 shares for two 10s. shares. These misleading statements, which one can hardly think were meant to be seriously urged, have been dealt with in a circular issued by the board on the 15th of January. While good dividends on the Robinson shares should no doubt be received, they would only continue for about three and a half years, whereas it is probable that the Crown Mines dividends, likely before long to increase, will be payable for more than thirty years. Clearly, the nominal value of the respective shares is a matter of no moment; the actual value, an altogether different matter, forms the real basis of comparison. Much was also made in that shareholder's circular of what is described as the enormous debenture debt of the Crown Mines. It will be sufficient to remember that the profit of that company during 1913, when admittedly it was working under disadvantageous circumstances owing to want of labour, amounted to not far short of one and a half times the amount of the total debenture debt. Equally ludicrous, but more serious in its consequences—as likely to remain in the minds of shareholders—is the statement made at a meeting in London, and repeated at a meeting in Paris, that by adoption of the scheme the Robinson Company would have sacrificed something like £1,750,000. The claim was made, in fact, that the assets of our company were worth £2,962,000, for which Crown Mines shares representing only £1,080,000 were to be given. If the reports are correct, and these statements were actually made and accepted as truth, it is not hard to understand how it is that a number of shareholders have expressed dissatisfaction with the scheme as thus explained to them.

"Sharemarket Value."

In attempting to arrive at an idea of how these extraordinary misstatements came to be made, it is clear that the critic took the sharemarket value of the 180,000 Crown Mines shares at the time he was speaking, while in the case of the Robinson he adopted another course and made a valuation of his own of the Robinson assets, which he enormously overvalued. Obviously, if market quotations were to be used for the purpose of making a comparison, they must be equally applied to both companies. When the first circular announcing the terms of the proposed sale was issued on the 13th of December, Robinson shares were quoted at £2 7s. 6d. and Crown Mines shares at £6 2s. 6d. After deducting the December dividends, five Robinson shares would thus represent a value of £10 2s. 6d. for which they were to have received £11 14s., the value of two Crown Mines shares; according to market valuations at the time the scheme was launched, therefore it would appear that the Robinson was unduly fafavoured. Comparing these market prices with the intrinsic valuations arrived at by the engineers which I have already mentioned, it will be seen that, excluding December dividends in both instances, in the case of the Robinson the intrinsic value exceeded the market value by 47 per cent.; while in the case of the Crown Mines the excess was only 28 per cent., indicating clearly, if such an indication were necessary, that there was no attempt in making these valuations to minimise the worth of the Robinson property.

Exaggeration of Assets.

Turning now to the exaggeration by this shareholder of the intrinsic value of the Robinson assets. He stated that the net profit to be derived from working the mine for 3½ years from the 31st instant would be £2,100,000, that is at the rate of £600,000 per annum, after allowing for profits tax. In a letter to the Press, it may be noted, he mentioned £650,000 a year for from three and a half years to four and a half years. Against this statement, unsupported by a tittle of evidence and presumably based on the assumption that something approximating recent profits will be maintained till the end of the life of the mine, I can but say that the most careful technical examination of all the facts by several competent engineers has led to the conclusion that the present value of the total net profits to be made from the mine from 1st. January, 1914, is, under the most favourable conditions, a sum slightly exceeding £1,000,000. I would here explain that, as has been stated in official reports from time to time, there are two classes of ore in our mine, the first consisting of the rich ore of the south reef and main reef leader, which has practically been responsible for all the profits earned; the second consisting of that of the main reef. This latter can only be worked to advantage if and so long as it can be used to supplement the richer ore so as to keep virtually the full mill running. The value of this ore is so near the limit of payability that during the last quarter of 1913 several stopes on it had to be stopped as unpayable, even under the above conditions. Taking into account the ore blocked out on the leader and south reef, which is already becoming scattered and therefore increasingly expensive to work, and estimating the small amount yet to be developed on these richer reefs and the ore to be recovered from pillars and old workings, there would only be sufficient from these sources alone to supply the mill for about sixteen months, crushing at the rate which obtained in 1913. Any one conversant with mining, however, knows that it would not be possible to continue to crush this ore at this average rate throughout that period, for as the points of attack decreased the rate at which it could be extracted and treated would diminish seriously. Were it possible to do so even for a time it is clearly undesirable to crush this ore alone if it can be treated along with main reef showing any profit at all. The aim has been in recent years, and will be in future, to mill as much main reef as is economically possible. How much can be treated at a profit it is impossible to say; as was stated at the last annual meeting, "the supply of labour available must, in the main, decide the rate at which the main reef can be mined, and the total tonnage that can be crushed during any given period; the scale of operations will largely decide what our working costs will be, and these again will decide how much of that reef can be treated profitably. The importance of crushing the maximum amount of main reef at a profit was dealt with by the chairman last year, and is specially referred to in the consulting engineer's report now before you.

How Long Will Milling Last?

It is not possible definitely to say how long milling operations will continue on our mine. The supply of unskilled labour, in the first instance, and the amount of ore that can be profitably extracted over a given period will decide that. The maximum profit would be realised by the milling of the largest tonnage available year by year and by the consequent working out of the mine in about 3½ years. To take a longer period to mill the payable tonnage which we believe still to remain in the mine would naturally involve increased expenditure per ton and a reduction in the eventual profit. It is clear that under any circumstances the monthly tonnage and profit, already decreasing, must steadily diminish during the period that milling is carried on, owing to the increasingly scattered nature of the workings and reduction in the points of attack. It is on the most favourable basis that the present value of the profit mentioned as yet to be made from the mine has been arrived at. Whether this profit will be realised it is impossible to say, but it can be said with certainty that amalgamation with the Crown Mines would have tended to produce conditions which would have ensured the most economical treatment of our ore on the lines indicated.

"Amateur Methods."

From the foregoing it will be clear that the amateur methods adopted by our critic of taking £600,000 profit annually for three and a half years is entirely inaccurate and misleading, and ignores the actual conditions of the mine and the mining methods which must be pursued. It must be borne in mind that, on the one hand, you have the estimate of men who have spent their lives in considering such problems, and have all the available facts before them, and, on the other the estimate of one who has probably never seen the plans of the mine. After such a misstatement the further errors into which our chief critic has fallen may appear comparatively trifling; but the errors have doubtless been accepted by some shareholders as statements of fact, and must be dealt with seriatim. (1) He added to the value of the Robinson assets £77,000 representing the dividends which will accrue during three and a half years on the 40,000 Crown Mines shares which we now own. It is quite clear, of course, from the circular originally issued to shareholders that the dividends on these shares must be excluded, as the shares were to be distributed to our shareholders in addition to the 180,000 Crown Mines shares which were to have been received. (2) £150,000 were also added to our cash assets by this shareholder as representing the profits of the Robinson to be earned during the first three months of this year. Clearly he has misunderstood, though there appears to be no excuse for his doing so, the clear statement that the 180,000 new Crown Mines shares which were to have been issued were to have ranked for any dividend declared by that company subsequent to the 31st of March, 1914. As was made clear in the original circular to shareholders, the amalgamation was to have been retrospective, and to have dated as from the 1st of January, 1914, and no dividend was to be declared by the Crown Mines between that date and the 31st of March. This item of 150,000 must also be deducted, therefore, from our critic's valuation of the Robinson assets. (3) Further £160,000 were included in our assets as the proceeds "promised by the Union Government of South Africa for our bewaarplaatsen rights, which amount was omitted from the original circular." The actual words as reported at the London meeting are quoted. As you are aware, the Government has unfortunately promised nothing on the subject. As stated at our last annual meeting, had the Bill then before the House of Assembly become law, we should have been entitled to receive approximately this amount over a term of years, but, as you know, the Bill was withdrawn, much to our regret, and it is at present impossible to foresee what will be the outcome of the prolonged controversy on this, to us, most important point. It must be mentioned, however, that if the Bewaarplaatsen Bill becomes law, the Crown Mines will be entitled to a considerably larger sum. No allowance was made in respect of this possible source of revenue in valuing the assets of either company.

If, added to the above misstatements, it is borne in mind that, in estimating the consideration to be received by our company, our critic has cut down the intrinsic value of Crown Mines shares by 30s. per share, it is not difficult to see how the enormous loss to the Robinson by the proposed transaction was arrived at by him. May I mention, as a further instance of the absurdity of these contentions, the simple fact that even at to-day's market quotations—and Robinson shares have had a rising tendency since the scheme was promulgated—the whole market value of the 550,000 Robinson shares, i.e., £1,512,500, is less than the sum which it is claimed the company would have lost by the proposed amalgamation.

Shareholders in Paris.

Apart altogether, however, from these exaggerations and misstatements, when it became apparent that there was opposition on the part of certain large shareholders in Paris, one of the members of our London committee approached them to ascertain their views. These gentlemen and firms, while not opposed to the amalgamation in principle, and while fully recognising the falsity of the statements to which I have referred in detail, expressed the opinion that, in view of the more speculative character of Crown Mines shares compared with an investment in Robinson shares, the Crown Mines should allow the Robinson rather more favourable terms. In originally formulating the lines of this suggested amalgamation, the idea was to provide the Robinson shareholders with a good lasting investment with certain speculative chances of improvement, in exchange for their security which had yielded such excellent returns, but which must be extinguished in a few years. The Crown Mines, however, had given the fullest consideration which it felt justified in giving, aod, consequently, it could not see its way to amend the terms proposed. Your directors felt that under no circumstances should a scheme of such vital importance be in any way forced upon the company, and that it must only be carried through if supported by an overwhelming majority. Being satisfied that a body of shareholders genuinely preferred to retain their investment and see our mine worked out by itself, your board approached that of the Crown Mines with a view of obtaining their consent to a cancellation of the agreement, to which they agreed, prompted thereto by a very clear expression of opinion on the part of some of the principal shareholders in their company. The scheme was, in consequence, abandoned, and will not be revived in any shape. Mr. Robellaz, one of the directors, in an interview in Paris, clearly disposed of many of the misleading statements which had been made. Fully convinced of the fairness of the proposal, Mr. Robellaz desired that the original scheme should be submitted to shareholders. While entirely endorsing the views expressed by Mr. Robellaz, the board decided, for the reasons which I have given, on the procedure which has been adopted. Mr. Robellaz, not agreeing with that course, has, therefore, resigned his position as a director of the company, and it is a matter of great regret that he should have felt it necessary to take this step, and that he could not see his way to agree with his co-directors in regard to this one point the method of procedure.

Mr. Hyman's Criticism.

Mr. E. M. Hyman thought the chairman had taken rather an unfair advantage of shareholders, and he (the speaker) was not prepared to argue at the moment on the figures and facts put forward by Mr. Aubrey Hyman. The chairman had said that Mr. Aubrey Hyman had been a registered shareholder of the Robinson since June, 1913; but Mr. Hyman had been a shareholder for the last ten years, possibly not a registered shareholder, but a shareholder. The speaker maintained they would not have got two Crown Mines shares for every five Robinson shares. They would have got slightly over one share for every five Robinson, and that proposal was taking the 40,000 Crown Mines shares of the Robinson to give the two Crown Mines shares for five Robinsons. He was surprised at the board of the Robinson taking offence at the opposition. Why did the board not call a meeting in London and put the matter before the shareholders? They were asked by Mr. Aubrey Hyman to do this and they refused. Mr. Reyersbach would not help Mr. Hyman in any way. Mr. Hyman before he moved in the matter wrote a letter to Mr. Reyersbach and asked for an interview. Mr. Reyersbach wrote back and said the letter required no comment. The speaker said that twice after that Mr. Hyman wrote to Mr. Reyersbach, and Mr. Reyersbach took no notice. The board in London, said the speaker, took no notice of the shareholders, but practically said "You can go to the devil." The speaker went on to say that it was hardly fair to European shareholders not conversant with South African finance to say there was a consultation between the two companies when it was known out here that the two companies were practically one. Why were the services of independent engineers not obtained and reports published so that the shareholders might know they were independent of the advice of the Corner House? Why, if the scheme was such a good one, did the Board not go on with it and see how the voting would go? A large number of shareholders in England were opposed to taking an interest in Crown Mines. They preferred to invest their own money when the Robinson was worked out. It looked as though the board would be beaten, or, after all the trouble to which it had gone, it would not have withdrawn the scheme. Why could it not have instructed Mr. Reyersbach to call a meeting in London and put the facts before it that the chairman had put forward to-day? The speaker wanted to know why members of the London staff went to Paris to try to prevent Mr. Aubrey Hyman from having advertisements inserted in the newspapers? When Mr. Hyman went to Paris to call a meeting he found every newspaper barred against him. What was the object of stating, as that board and other boards had done, that they wanted shareholders to take more interest in the company, and when they did take an interest everything possible was put in their way and the board offered to resign? Mr. Aubrey Hyman had not gone out of his way to oppose the board and make misstatements with the idea of getting cheap notoriety. Before he did anything, he wanted to talk to the board, but the board refused to hear him. The figures he had put forward were founded on the most reliable data he could get. In conclusion, the speaker said he thought it was to be regretted that the board of directors did not meet the shareholders in London.

A Bargain.

Mr. Alexander asked if the shareholders would be permitted to see the proxies either for or against the scheme.

The Chairman: The number of proxies?

Mr. Alexander: The proxies themselves.

The Chairman pointed out that that was rather unusual, and he did not think he could agree to this course.

Mr. Alexander: Would you tell me how many proxies you have against the scheme?

The Chairman said only 187 shares had been lodged against the scheme.

Mr. Alexander asked why the directors had resigned, and the chairman pointed out that dissatisfaction had been expressed with their conduct, on the part of some of the shareholders.

Mr. Hyman: Is it impossible to show these proxies? Have we not a right to see the proxies against the scheme?

The Chairman said he did not want it to appear that he was blocking the way to the shareholders asking for information.

Mr. Hyman: I can tell you we have nearly 100,000 proxies against the scheme.

Mr. Schumacher: We should like to have seen them.

The Chairman: Will you show them to us? I think that will be a very fair bargain.

Mr. Hyman: Yes. I will ask them to be sent out.

The Chairman: If you show the ones you have against we will show the ones we have in favour.

Mr. Lionel Cohen said it was impossible at a meeting of that description to deal with a statement like that made by the Chairman. The speaker referred to previous schemes of amalgamation and their disappointing results, and, in the course of his remarks pointed out that if working costs were reduced the value of Robinson shares would be enhanced. As for bewaarplaatsen, the only opposition in the Hosue of Assembly against it being granted was from Mr. Hull, who carried very little weight. The Government was in favour of dividing the bewaarplaatsen revenue with the freehold of owners. This would be another very important point in favour of the Robinson Company. As for Crown Mines, he admitted it was a fair proposition; but it was impossible to state the value of the Crown Mines. There was an enormous amount of low grade ore, and at the present moment the richer portion of the Crown Mines was being worked, and the future could only tell what would happen.

Mr. Boyd, in reply, said he took serious exception to one remark of Mr. Hyman. If he understood Mr. Hyman rightly, he really reflected on the honour of the engineers under whose supervision the work was done.

Mr. Hyman pointed out that he did not reflect on the honour of the engineers. He thought they were most straightforward men. At the same time they had to act on what they believed, and usually they believed they were right.

The Chairman said he understood Mr. Hyman to say they had to act on their orders.

Mr. Schumacher said he was very glad Mr. Hyman had withdrawn the words because he understood him to say they had to act on orders.

Mr. Boyd, in his further remarks, said there was no doubt that shareholders would have got two shares in exchange for five. There were large shareholders in Paris who did not wish the scheme to go through, and the board submitted themselves to their wishes.

The meeting then ended.

Besides Mr. H. C. Boyd, there were present Messrs. F. C. Adams, C. L. Burke, F. H. Barry, E. Callens, G. H. Darby, C. Distel, W. J. Endean, S. Evans, Comte F. de Ferrieres, H. L. L. Feltham, M. Honnet, J. Jourdan, H. J. McCormack, R. Martin, E. Renaud, R. W. Schumacher., S. C. Steil, H. W. Thomas, C. C. Beaumont, S. W. George, B. Alexander, L. Cohen, E. M. Hymann, M. Mendelsohn, R. E. Philpott, W. Rosenberg, F. Raleigh, A. W. Tucker, A. B. Griffiths, and A. P. Richter.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—Lewis Waller Co.	8.15
Standard—Louis Meyer's Company	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

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South African Gold Mines, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Eleventh Ordinary General Meeting of Shareholders in the South African Gold Mines, Limited, will be held in the Board Room, The Jeppe Arcade, Commissioner Street, Johannesburg, **on Wednesday, 17th June, 1914, at 3 p.m.**, for the following business:—

1. To receive and consider the Directors' and Auditors' Reports, the Balance Sheet, and Profit and Loss Account for the year ended 31st December, 1913.
2. To elect Directors in the places of the present Board, consisting of Mr. Julius Jeppe, Sir Abe Bailey, K.C.M.G., and Messrs. J. H. Ryan, J. Emrys Evans, C.M.G., and B. Southwell, all of whom retire in accordance with the Articles of Association, but are eligible and offer themselves for re-election.
3. To appoint Auditors for the ensuing year, and to fix remuneration for the last audit.
4. To transact general business.

The Share Transfer Books of the Company will be closed from 8th to 17th June, 1914, both dates inclusive.

By Order of the Board of Directors,
O. F. BROTHERTON,
(for the Witwatersrand Township Estate and Finance Corporation, Ltd),
Secretaries

Head Office: The Jeppe Arcade,
Johannesburg, 5th March, 1914.

Leeuwpoort (African Farms) Tin Mines, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Second Ordinary General Meeting of Shareholders in the Leeuwpoort (African Farms) Tin Mines, Limited, will be held in the Board-room, The Jeppe Arcade, Commissioner Street, Johannesburg, **on Wednesday, 17th June, 1914, at 3.30 p.m.**, for the following business:—

1. To receive and consider the Directors' Report and Accounts for the year ended 31st December, 1913.
2. To confirm the election of Mr. William Julius Gau to a seat on the Board, and to elect two Directors in the places of Messrs. John Hall Ryan and Bailey Southwell, who retire in accordance with the Articles of Association, but are eligible and offer themselves for re-election.
3. To appoint Auditors for the ensuing year, and to fix remuneration for the last audit.
4. To transact general business.

The Share Transfer Books of the Company will be closed from 8th to 17th June, 1914, both dates inclusive.

By Order of the Board of Directors,
O. F. BROTHERTON,
(for the Witwatersrand Township Estate and Finance Corporation, Ltd),
Secretaries.

Head Office: The Jeppe Arcade,
Johannesburg, 5th March, 1914.

African Farms, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Twelfth Ordinary General Meeting of Shareholders in the African Farms, Limited, will be held in the Board room, The Jeppe Arcade, Commissioner Street, Johannesburg, **on Wednesday, 17th June, 1914, at 4 p.m.**, for the following business:—

1. To receive and consider the Directors' and Auditors' Reports, the Balance Sheet, and Profit and Loss Account for the year ended 31st December, 1913.
2. To elect two Directors in the places of Sir Abe Bailey, K.C.M.G., and Mr. Julius Jeppe, who retire in accordance with the provisions of the Articles of Association, but are eligible, and offer themselves for re-election.
3. To appoint Auditors for the ensuing year, and to fix remuneration for the last audit.
4. To transact general business.

The Share Transfer Books of the Company will be closed from 8th to 17th June, 1914, both dates inclusive.

By Order of the Board of Directors,
O. F. BROTHERTON,
(for the Witwatersrand Township Estate and Finance Corporation, Ltd),
Secretaries.

Head Office: The Jeppe Arcade,
Johannesburg, 5th March, 1914.

Treasury Gold Mines, Limited

(IN LIQUIDATION.)
(Incorporated in the Transvaal),

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that a First Liquidation Dividend of Five Shillings per share has been declared payable to Shareholders of the above Company, at the Head Office, Cullinan Building, Johannesburg, or at the London Office, Salisbury House, London Wall, E.C.

Shareholders are accordingly requested to forthwith surrender the Share Certificates or Bearer Warrants held by them, either at the Johannesburg or London Offices of the Company. Dividend Warrants will be posted to Shareholders as soon as possible after the surrender of the Share Certificates or Bearer Warrants as aforesaid.

By order of the Liquidators,
A. GREGOR, Acting Secretary.

Head Office: Cullinan Building,
P.O. Box 506, Johannesburg,
25th March, 1914.

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CONTENTS.

PAGE
Notes and News 113
Topics of the Week:
  More Views on the Life of the Mining Industry ... 115
  "Kimberlization" and the Colour Bar 115
  The Gorgas Report on Rand Mine Sanitation ... 116
Progress at the Modderfontein Government Areas ... 117
Hammer Drills in Barnato Mines 118
The Harrisdale Syndicate's Tin Property 118
The Crown Mines Reduction Plant 119
New Unified Records Substantial Progress 119
Restriction of Development Work 120
Big Profits from 1½ dwt. Ore 121
Position of the Natal Coal Industry 122
"Knights" Record Year of Prosperity 122
The Position at the Glencairn 123
Position of the United Jack Gold Mining Co., Ltd. ... 123
Orcharding Prospects in Tasmania 124
Regular Returns the Feature of the New Primrose Year 125
Excellent Showing at the Van Ryn Deep 125
The Labour Party and Taxation of Land Values 126
Gratifying Progress at the Consolidated Langlaagte ... 127
Correspondence and Discussion: "Sakalava Oil"; "What is Wrong with South African Mining?" ... 129
Discouraging Outlook at the New Rietfontein 128
The Year with the Ginsberg 128
Oil Shale Mining—I. 130
Rhodesian Section:
  Latest Mining News 131
  Mining Progress in the Belgian Congo 132
  Rhodesia's New Producers 132
  The Wankie Colliery 133
  Rhodesian Mineral Output 134
Engineering Notes and News 137
  Safety Rules—Electrical Installation 137
  Electric Mine Hoists 138
Finance, Commerce and Industries 139
Mining Men and Matters 141
The Week in the Sharemarket 141
Company Meetings: "Cassel Coal"; York G.M. Co.; Wolhuter G.M. Co.; Simmer Deep; Jupiter; East Rand Deep; Vereeniging Estates 142

Notes and News.

The Mount Anderson Gold Field.

The Lydenburg area in general, and of that district the Mount Anderson gold field in particular, looms large in the public vision to-day, and, as we announced a week or two ago, there is much activity in this locality at the present moment. A rich reef and alluvial field is reported to have been discovered in the vicinity of Mount Anderson, and as a result of crude working on one or two blocks of claims sensational returns have been secured. Specimens of nuggets, reef gold and gold beaten out by pestle and mortar exhibited in Johannesburg during the week are of extraordinary richness, and although it would be foolish to place too much reliance on these exhibits there can be no question that, in some places at any rate, the Mount Anderson field is a highly profitable proposition. We understand that a syndicate styled the Formosa G.M. Syndicate, with a capital of £25,000, is in course of formation locally to exploit the claims in question.

*   *   *   *

The Splendid Prospects of the Van Ryn Deep.

Few mines, either in South Africa or the whole world have made such a magnificent début as the Van Ryn Deep, and it does not require an optimist to believe that the initial dividend, declared last December, is to be the forerunner of many other and far larger distributions. Although the Van Ryn Deep commenced crushing under most unfortunate auspices—at the time of the July strike—and although the disorganisation of industry and the unsatisfactory nature of the settlement arrived at affected the Van Ryn Deep to a greater extent than any of the other mines of the Barnato Group, the company earned a profit last year of £105,000. Satisfactory as this result has been, it is very much below the earning of the last month or two. In February, for example, the mine held pride of place in the matter of profit amongst the subsidiaries of the Barnato Group, with a total of £25,429, and it is certain that this result will be easily eclipsed in the near future. One has only to examine the ore reserve position of the property and to realise that working costs at this mine are likely to be materially reduced during the next few months, to recognise that the dividend-earning potentialities of this mine are very great indeed. At the end of the year the payable ore reserves amounted to 1,953,845 stoping tons of an assay value of 8.6 dwts., and after allowing for sorting, the milling tonnage stands at 1,660,767 tons of an assay value of 10.1 dwts. Having regard to this, it will readily be admitted that the statement of the Consulting Engineer, that the recovery value should not be less than 35s. per ton, does not err on the side of exaggeration.

*   *   *   *

The S.A. Diamond Corporation and Blaauwbosch.

Operations of the South Africa Diamond Corporation, Ltd.—a Lewis & Marks subsidiary—were some time ago extended to the Blaauwbosch Diamonds, Ltd., and it is a sign of the importance which this latter proposition has assumed and the high esteem in which the Blaauwbosch is held that the office of the company has recently been transferred to the Lewis & Marks building. The success of the Blaauwbosch mine has been nothing short of remarkable. The concern has already returned 95 per cent. to shareholders, and it is anticipated that regular quarterly dividends of 1s. per share will be maintained, at any rate for some time to come. Recent developments at the mine are understood to have indicated the extension of the claim area to the east, so that a longer "life" than has hitherto been calculated on seems likely. The South African Diamond Corporation, in addition to its large interest in the Blaauwbosch mine, has substantial holdings in the Crown, Pniel, New Vaal River, New Thor and Roberts Victor mines.

Tom Mann vs. Mr. Creswell.

In the intervals of preaching Syndicalism, four hours a day, and such like, Mr. Tom Mann has managed to do a considerable amount of damage to Mr. Creswell's pet theories and beliefs. At the Wanderers on Monday the Syndicalist Chief smote Mr. Creswell's proposals hip and thigh. He denounced as a crime the fact that men went down the mines for 7s. 6d. a day. That sort of thing, he said, was the effect of Capitalism. He forgot that it was, as a fact, the effect of Mr. Creswell's teachings, that it was the aim of all Mr. Creswell's strivings, and that it is still for all we know to the contrary, the first plank in the platform of the Labour Party. Fortunately, Mr. Creswell's own words are on record, taken from his famous report to the directors of the Village Main Reef, when he was manager of that mine. In that report Mr. Creswell wrote as follows:—

> There are numbers of men now serving in the Army in South Africa who would like to find work here, but who have no trade. These find, on applying at the mines, that there is no intermediate employment between that of the skilled artisan and "niggers' work," and therefore no chance of work for them. It is a delicate matter to handle, and one certainly does not want to give the ordinary white artisan on these fields the idea that, in spite of all utterances to the contrary, an attempt is to be made to swamp the place with cheap white labour, and so be in a position to reduce his wages. In point of fact, however, what I propose would in no way be detrimental to the skilled artisan, and the labour I suggest importing, if necessary, would not compete with the mechanic, but would merely tend to oust the native. In other words, I suggest the introduction into this country of the class of labour which is practically non-existent here, that is, what we know as the navvy class at home. In order to get this class of labour at a rate that it would be profitable for us to make use of it, it would be necessary to place them on an altogether different footing from our highly paid artisan class, who live in rooms, for which they pay us 10s. per month and pay £5 10s. to £6 per month for their board in the mine or other boarding-house. My idea would be that they should live in barracks, which we could build especially for them, be served out with rations on the Army scale, that they should make their own arrangements about cooking, etc., and receive pay to the extent of 5s. per diem over and above their rations. This would represent a total cost to us at the present time of probably 9s. a day, or about £11 10s. per month, and, as I have shown above, at this rate white labour can be profitably employed by us to-day.

According to Mr. Mann the foregoing is the evil fruit of Capitalism, and poor Mr. Creswell is, by implication, condemned as the Capitalist's tool masquerading as the friends of the worker. This, indeed, illustrates but one of the many bewildering points of difference between Mr. Mann and the people whose policy he has ostensibly come out to advance. Well may the Labour Party pray to be saved from its friends of the Mann type!

* * * *

Against the Sympathetic Strike.

It is significant that the Executive Committee of the Labour Party refused to allow Mr. Larkin to address the Glasgow Conference on the question of the Dublin strike. The National Transport Workers' Federation also decided finally to dissociate the Dublin strike leader from that body. These decisions resolve themselves into a complete withdrawal of all official support from Mr. Larkin. It is interesting to note, in passing, that no more strike pay or food supplies being forthcoming from England, the Dublin strike may be considered as having collapsed; it had lasted over twenty weeks. The men have returned, and are returning, on the employers' terms. It is further noteworthy that the United Builders' Labourers' Union have put forward a very significant undertaking which the employers have accepted. Each man who is a member of the Union signs the undertaking on applying for work and hands to his employer a card which states that he agrees to act in accordance with the undertaking. This reads as follows:— "We undertake, on behalf of the United Builders' Labourers and General Workers of Dublin Trade Union, that none of our members will remain, or become in future, members of the Irish Transport and General Workers' Union; further, that our members will not take part in, or support, any form of sympathetic strike. They will handle all materials, no matter from where, or how delivered, and carry out all instructions given to them in the course of their employment. They will also work amicably with all other employees, whether they be members of a union or not, and none of our members will in any way interfere with or make any objection to work with those who have already signed any agreement. Any of our members who may make any breach of any of these undertakings will be immediately dismissed from our Union, the employers undertaking to re-employ such of our members as they may require on the terms in force previous to September 16th last." Now, if the unions on the mines were to introduce and adhere to such a commonsense undertaking, we should hear less of employers' reluctance to recognise them.

* * * *

An Unbiassed Opinion of Labour Unions.

Mr. Charles F. Pender, a member of the New Haven Trolleymen's Union, wrote to ex-President Eliot, of Harvard University, to find out why that distinguished scholar manifested such a dislike for the trade unions. He asked Dr. Eliot if he was aware of the fact that trade unionism had brought happiness to the worker because of shorter hours and increased pay. He also asked about profit-sharing by employees of a company. Dr. Eliot replied as follows:—

> I agree with you that trade unions have raised wages and shortened hours, and that collective bargaining in some industries has been decidedly advantageous to the working people. There can be no question that the factory system has been greatly improved in the course of the last hundred years through the war waged by the trade unions against employers and managers, and that it needed and still needs improvement. My objections to the trade unions are altogether educational and moral. They seem to me to have had a bad effect on the character and happiness of their members because of certain methods which they have used and are still using. The first of these objectionable methods is the habitual use of violence against persons and property to gain their ends. The second is the limited output. The third is the uniform wage, alike for all journeymen without regard to age or skill. The fourth is the disregard of contracts—their own contracts and the contracts which employers or managers have entered into with owners or consumers but have not yet fulfilled. The first and last of these practices are grave violations of the universal moral sense. The second and third rob the working man of strong motives for self-improvement and make it probable that he will do no hearty, zealous, faithful work. Under those conditions it is impossible to be happy in the life work; for there is no happy, contented work except that done with good will, generous zeal and loyalty. I cannot agree with you that the trades unions have brought happiness to any working men. Higher wages, shortened hours, better clothes and more meat do not necessarily contribute to genuine happiness, any more than the luxuries of the rich do. Happiness and content are states of mind. Is it not perfectly plain that in our country the trade unionists are not really happy as a matter of fact? To my thinking they never will be, so long as they get no satisfaction in their daily work. It is the grudging spirit in which they work which prevents them from getting any content out of their work for a livelihood. All well read, thinking people believe that the progress of civilisation depends on universal, steady, productive labour; the unions seem to believe that the less one works the better. Although profit sharing is not applicable in all industries, I see in sound methods of profit sharing one mode of escape from the deplorable effects of trades-union teachings; for just profit sharing will present to employer and employed alike precisely the same motive for faithful, generous, co-operative industry and for successful productiveness. No profit-sharing method will work which does not turn out to be in the long run profitable alike to employer and employed, to owner and wage earner, to capital and labour

Dr. Eliot is a distinguished philosopher and has the gift of summarizing great ideas in a few words. In the above he has, it seems to us, stated the whole philosophy, sociology and economics of labour unionism. It is noteworthy that the question arose at a dinner of the Massachusetts Reform Club, on February 20th, when Dr. Eliot declared that "labour unionism is the most formidable danger in our future." "It is a moral danger," he continued, "as well as material. The unions just rot a man's character and no one can escape their influence. The tendency is to work day after day with the deliberate purpose of doing as little labour as possible in the least number of working hours. Our Government is afraid to tackle this monopoly. We find our political leaders submitting more and more to organised labour. The present railroad situation is a straight consequence. The trade-union spirit on the railroads is destroying essential discipline and earning power. We can hope for no remedy of this evil from either the national or state governments. Politicians are becoming more and more afraid of organised labour, despite the fact that there are only about 2,000,000 votes out of that class in the total of 17,000,000 voting strength of this country."

TOPICS OF THE WEEK.

MORE VIEWS ON THE LIFE OF THE MINING INDUSTRY.

The fact that the Dominions Royal Commission follows so closely on the Economic Commission made the evidence given before it on Thursday in regard to the mining industry something of an anti-climax. The Commission, however, served one useful purpose in affording an opportunity to certain witnesses to expand, qualify and justify evidence led before its predecessor. This, of course, was owing to the fact that the Commission sat in public, and its enquiries cover the whole field of trade and industry in the Dominions. For instance, Mr. Kotze, the Government Mining Engineer, was given an opportunity to state explicitly how far he agreed with the now famous Chamber of Mines estimates of the life of the Rand; and the Chamber, in its turn was able at once to explain its famous evidence and give the authors a chance to justify themselves by entrusting its representation to the gentlemen largely responsible for the preparation of that evidence. Hitherto, of course, we have only had Mr. Kotze's view vicariously reflected in the statement of the Minister of Mines. Now we have Mr. Kotze's *ipsissima verba*. Asked by the Chairman what he thought of the estimate given by the Chamber of Mines to the Economic Commission of the life of the gold mining industry, Mr. Kotze is reported to have replied: "The Chamber of Mines did not furnish an estimate of the life of the industry, but of the life of the existing producing mines." Mr. Kotze added that he had no serious criticism to offer to the Chamber's estimate that there are still five hundred and fifty million tons of payable ground to be taken out of the mines. His estimate was five hundred and eighty-seven million tons. Asked what was his estimate of the payable ore in undeveloped areas, Mr. Kotze said it was an extraordinary difficult question to answer, the data were so inadequate. He anticipated further reduction of working costs. It was not improbable that as far as the new areas are concerned they will yield as much as the existing mines are still estimated to produce. It was difficult to say what capital would be required for the development of these areas. Perhaps it could be put at £50,000,000. He foresaw further reduction of working costs, not so much by reduction of wages, but by increase of labour efficiency. Mr. Kotze showed how labour efficiency had increased during the past few years, the influence of rock drills being very great in attaining that increased efficiency. The chief point in Mr. Kotze's evidence, of course, is that he agrees generally with the Chamber of Mines statement, though he thinks they have underestimated by 37,000,000 tons the tonnage of payable ore still to be taken out of producing mines, and that Mr. Way has over-estimated by £36,000,000 the amount required to bring the undeveloped areas of the Rand to the productive stage. As neither Mr. Kotze nor Mr. Way show how we are going to attract any capital at all—beyond the unsupported expressions of opinion that costs will further come down—this difference in their globular estimates may be accepted as merely academic. The hard fact remains, however, that when the 587 million tons of ore (or 550 million, according to the Chamber of Mines) in the present producing mines are exhausted, the Rand is finished too, unless, in the meanwhile Mr. Kotze can devise some scheme to attract the necessary £50,000,000 (or £86,000,000, according to Mr. Way) to develop the Far East Rand. It is a pity the Dominions Commission did not put a direct question to Mr. Kotze on this vital point. The witness apparently did not volunteer the information that of the three schemes already framed by the Government to attract capital to the very area where lies the future of the Rand when the 587 million tons aforesaid are exhausted, the first had yet to prove itself a success and the other two had signally failed to attract capital. Nor did Mr. Kotze hold out the slightest vestige of hope that anything would be done by the Government to frame more attractive terms. How serious is this delay may be seen from the fact that of the 86,000 claims on the Far East Rand which are mainly what the Rand has to look to when the existing mines are exhausted, nine-tenths belong to the Government. And the Government makes no move.

It is all very well to tell us that working costs will come down. Unfortunately, this has been the burden of every speech for the last three years, and how much have they, on the average, come down? Something is always cropping up to dash our hopes in this direction. Yesterday it was the necessary outlay on improving underground health conditions; to-day we are faced with further expenditure to carry out the Gorgas recommendations on the surface. Dire necessity, it is true, may force us, willy nilly, to work more cheaply; and the views of Mr. Ralph Stokes, quoted in another part of this paper, may be adduced in support of this hope. But surely such a course is little better than a counsel of despair. "Drive thy business," says the proverb, "lest thy business drive thee." And if for business we read industry, is it wise that we should wait for the industry to drive us? Circumstances, we are blandly told, will inevitably entail the reduction of costs—but can any counsel be weaker? The modern Caesar of industry makes such circumstances, and to vary the metaphor, instead of drifting along the waves of uncertainty, the existence of the Rand must be put, by foresight and taking thought, above the reach of chance. Some of the methods suggested before the Dominions Commission for thus permanently and substantially reducing working costs are dealt with in the succeeding article.

"KIMBERLIZATION" AND THE COLOUR BAR.

It is only to be expected that the lay Press will make a great outcry over some of the evidence given before the Dominions Commission on Thursday. A howl of indignation will doubtless greet Mr. Kotze's declaration in favour of the "Kimberlization"—to coin a fearful word—of the Rand. And Mr. Way's calm acceptance of the possibility of a black but competent mine manager will doubtless also cause much searching of hearts. We must confess that by neither prospect are we dismayed. There is nothing, after all, surprisingly new in the talk of making the Rand a second and larger Kimberley. Years ago we quoted in these columns the private opinion of one of the most thoughtful of our industrial leaders to the effect that the whole Rand would at no far distant date probably be split up into but twelve big mining units. From that to the final and complete Kimberley stage is obviously but a step, and no one needs to be reminded of the many undoubted merits of the trust or German system of industrial consolidation. Moreover, the plan has the great advantage of being highly acceptable to the workmen. Everywhere the formation of big trusts is welcomed by the Socialists—and on the Rand we are all Socialists nowadays—as connoting a stage on the way to the "future State," based on community of ownership of the means of production. Therefore, if the leaders of the industry and the shareholders can only be got to agree—and the former cannot pretend that they have not heard about the proposal before—the other two interested parties, the employees and the Government, may be regarded as willing. It cannot be denied that Mr. Kotze's testimony is most significant. The Government Mining Engineer was asked by Sir Jan Langerman: "If the whole of the Rand were amalgamated, would it be of advantage to the country?" The answer was: "It would be an advantage industrially and to the worker. I think we should have a better and more contented body of workmen. From an engineering point of view I see no objection, nor from an economic point of view. There might be political objections." It is a pity Mr. Kotze did not state from whom he feared the political objections. We are given to understand that only the Government and Red Flag political parties remain; and while the views of the latter, as we have stated, are known to be favourable, Mr. Kotze may be taken to voice that of the Government. Plainly, it is now "up to" some of the heads of the industry to give us a lead on the point. That we shall not have long to wait for the dissent of the long-suffering commercial community we do not doubt; and for their benefit we wish it to be clearly understood that we do not advocate the scheme. We merely chronicle the facts and indicate the direction in which men's thoughts are moving. With regard to the second big question raised on Thursday—the Colour Bar—our views are too well known to need repetition. Mr. Kotze, for obvious reasons, did not commit himself on this question to anything more definite than stating that "some natives with sufficient training and education could be as good workmen as whites." Mr. C. H. Villiers, the Chairman of the Native Recruiting Corporation, on the other hand, showed that he is on this question in complete accord with Mr. H. M. Taberer, and he put it on record that the removal of the colour bar would in his opinion do away largely with the necessity for recruiting. As on this costly process the industry, according to the same witness, spends £650,000 per annum, the enormous saving possible under this one head is obvious. Mr. Way, questioned in regard to the colour bar, said that the Chamber had made a statement before the Economic Commission, pointing out exactly where the Government prevented the use of coloured labour. Referring to the statement in question, Mr. Way said that it showed that such work as that of banksman, ganger and onsetter might be done by natives when the wage would be less than that earned by white men for the same work. Mr. Way mentioned several other cases, and he added that when asked by the Commission if he would allow a native to manage a mine, he had replied that he saw no objection if the native were competent. In the absence of any official estimates, we can only guess at the saving that would result from this desirable reform. Apart from the direct saving in recruiting mentioned by Mr. Villiers, there can be little doubt that economies equalling, roughly, a pennyweight of gold per ton would be possible within a few years after the change was made. In this direction—and in this direction alone—do we see light in regard to rendering attractive to capital the large undeveloped areas upon which the Rand depends to replace its waning present producers. If the Dominions Commission, therefore, wish to prolong the industry and further secure the prosperity of the whole country they will speak out loud and clear on this question and add the weight of their plain and unbiassed testimony to that of the Economic Commission.

THE GORGAS REPORT ON RAND MINE SANITATION.

The Transvaal Chamber of Mines issued this week the report of Surgeon-General W. C. Gorgas, Chief Sanitary Officer of the Isthmian Canal Commission, as to sanitation concerning the employees of the mines on the Rand. General Gorgas, it will be remembered, was invited to investigate the causes of the high death rate from pneumonia among the native labourers, and to make such recommendations as might appear necessary for the reduction of the mortality, and the improvement of the general sanitary conditions of the mines and compounds. In his investigation, which began early in December last, he was assisted by Major Robert E. Noble, Medical Corps, United States Army, General Inspector of the Department of Sanitation, Isthmian Canal Commission, and Dr. Samuel T. Darling, Chief of the Board of Health, Laboratory Department of the Sanitation Isthmian Canal Commission. The proposals put forward in the report are of the most important description, and involve changes in the existing conditions on the mines. General Gorgas shows that the death rate among natives employed on the mines and on industrial works in the Transvaal in 1903 was 71·7 per 1,000. In 1912, for some 300,000 employees in the same area it was 26·84. "This rate," says the report, "is still very much too high, as we are considering men in the prime of life." "According to the Native Affairs Department, the total death rate from diseases was 22·6 per 1,000, the four highest being pneumonia 9·8, phthisis 5·1, meningitis 1·3, and enteric fever 1·1." "These four diseases," it is pointed out, "are all more or less infectious and contractable. If they could be got rid of entirely the rate for 1912 would be reduced to 5·0 for all other diseases. While the entire eradication of these diseases cannot at present be accomplished in this or any other community, probably by proper hygienic measures a very appreciable reduction could be accomplished."

"The report, which has been printed in the daily papers, is too lengthy to quote more fully here. Summarising his recommendations, General Gorgas states: Of sanitary recommendations I consider that of increasing floor space to about 50 feet the most important and pressing, and by far the best way of doing this to be the village hut system, and the introduction of families; if this particular method cannot be carried out, to come as near as it is feasible. The second in importance I consider is improvement in the hospital system, and the care of the native sick. This can be best carried out by a central hospital, and if a central hospital is not feasible, by such concentration of hospitals as is possible. The third in importance is the establishment of a central sanitary bureau or department under the Chamber of Mines, the head of this department to represent the mines on all sanitary questions. The revision of the present regulations regarding matters of sanitation so that sanitation of mines might be accomplished by the authority of one official of the Government or municipality, instead of with five different interested parties as is now the case.

With these recommendations, of course, no one can quarrel. They are clearly feasible, and present no insuperable obstacles on the ground of expense that is not demonstrably justified by the economic value of the conservation of human life they hold out. It may be objected that the report appears to contradict itself in so far as it approves at once of the Kimberley compound system and of the open village life for the native worker. On the whole, however, the advantages of the latter are more strongly endorsed, and it is along that line that the report counsels advance. A strong plea is entered for the prohibition of alcohol to native workers, and it is to be hoped that some good may result. A feature on which little stress has been laid is the recommendation that workers affected with tuberculosis should be excluded from the mines altogether. This is a drastic measure, but one that cannot fail to commend itself. Doubtless we cannot expect the mine doctors to receive the report without demur; but as laymen we shall be surprised if they can find any flaw in its reasonable and eminently commonsense recommendations, to which no higher tribute can be paid than to describe them as worthy of the great reputation of their author.

A Lesson from Alaska.

The following is an extract from a letter, dated February 15th, 1914, from Mr. Ralph Stokes, of New York, regarding the statement on the "Future of the Witwatersrand Gold Mining Industry," submitted to the Economic Commission in December, 1913. "The Rand will have its ups and downs," writes Mr. Stokes, "its revolutions and crises, but do you not think it will still be the greatest gold field in the world 50 years hence? Just as the 'high cost of living' is simply a reflection of the people's ability to spend, I regard the Rand's working costs reflective of the industry's ability to bear them. When, in thirty or forty years, the Rand gradually becomes unpayable on present standards, new 'standards of necessity' will be established, under which the new pay limit may be little above the absolute minimum in cost of Kafir food, machinery and stores? 2½—3 dwt. mines will be attractive, just as 1½ dwt. mines are proving in Alaska to-day." Mr. Stokes is referring to the operations near Juneau, in Alaska—fully discussed elsewhere in this issue—whereby the successful mining and milling of the huge bodies of low-grade ore are accomplished. The operation of the Alaska-Treadwell and the experiments conducted by the Alaska Gastineau and Alaska Juneau companies have proved that ore containing $1.50 to $2 per ton in gold can yield a profit where extensive deposits are mined on a huge scale. By the end of this year the last two companies mentioned should be recovering about $5,000,000 worth of gold annually, and this production will in time be doubled. The lesson for the Rand is obvious. Alaska may be able to teach us nothing in the details of milling practice; and its mining problem being mere quarrying may differ in essence from ours. But the profitable possibilities of crushing low-grade ore on a large scale for a trifling profit on the ton basis are apparent and should set our captains of industry thinking.

PROGRESS AT THE MODDERFONTEIN GOVERNMENT AREAS.

Advance of Construction Work—Last Year's Development Analysed—Prospects Steadily Improving.

Constructional work at the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., is progressing steadily, and in the course of the next week or two the property will assume a much more advanced appearance as the erection of some of the more important buildings, such as the tube mill house, is to be taken in hand almost immediately. Excavation and foundation work is now well advanced, the mortar blocks are cast, and it seems tolerably certain that the whole equipment will be ready for work before the end of the year.

The Milling Plant.

We have already given details of the new plant, but as Prof. Lawn, in his consulting engineer's report, summarises the outstanding features of the installation in a few lucid lines, we append his description:—

> A reduction plant capable of treating 50,000 tons per month has been ordered, and work on excavations and foundations has already been commenced. The plant will consist of 100 stamps, each of 2,000 lbs. weight, and ten 16ft. 6in. by 6ft. tube mills. Amalgamation will take place after the coarser ore has passed through the tube mills, and the pulp will then be separated by cone classifiers into sand and slime for cyanide treatment. The sand plant will have three collectors of 56 feet diameter, each capable of holding 740 tons of sand. The sand from the collectors will be conveyed by belts and delivered by a Blaisdell distributor into the treatment tanks. There will be eight treatment tanks of 56 feet diameter, each capable of holding 740 tons of sand. The slime plant will consist of six collectors, each 70 feet diameter and 19ft. 6in. high, including the cone bottom; nine air agitating tanks, 45 feet high and 15 feet diameter; and a Butters filter plant. Precipitation will be in the usual divided boxes filled with zinc shavings. Indeed, the general design of the plant is on similar lines to that of the Van Ryn Deep, only the probability of considerable additions in the future has been kept in view throughout, and this has caused modification of many details. It is expected that the plant will be ready towards the end of this year, and, provided there is no serious shortage of native labour, the mine should by that time be ready to maintain a steady supply of ore sufficient to keep the full plant running.

Development.

Interesting as are questions relating to equipment, the state and progress of underground development is manifestly much more important. The Modder Areas is an enormous property—one of the very largest on the Witwatersrand—and the width and value of the reef disclosed in the 2,633 claims of the company is a matter of the greatest moment, not only to this company but to the Rand as a whole, and particularly the Further East Rand. Taken on the whole, the results secured must be considered satisfactory. As in other sections of the Far Eastern Rand, the ore is of somewhat erratic value, and rich patches and poor patches mingle together. However, over half a million tons of payable ore have been developed in the northern section of the mine, the average value of this development being 6·6 dwts. over a stoping width of 50 ins. Professor Lawn, the consulting engineer, in his annual report, discusses the question of development as under:—

> During the year the two southern shafts reached the reef, and development work has been begun from them. The reef in both shafts was deeper than had been estimated from such data as was available; and in the south-west shaft a considerable amount of water was struck at a depth of 3,400 feet, which considerably delayed the latter part of the sinking. The reef where struck in the south-east shaft was of high grade, but where struck in the south-west shaft it was poor. The little driving which has been done near the south-west shaft shows, however, payable reef, and the development from both shafts is looked forward to with hopeful anticipation. Development from the two northern shafts was pushed steadily during the year, and as rapidly as the available labour force allowed. The results obtained are detailed in the manager's report, and must be looked upon as satisfactory. The ground is of similar character to that usually found in the Far Eastern Rand. That is to say, there are areas of good ground interspersed with patches of unpayable ground. As will be gathered from the figures given, a little more than half the development footage on reef was payable. In the northern section 559,500 tons of payable ore have been developed. The ore has an average value of 6·6 dwts. over a stoping width of 50 inches.

Development Analysed.

With a view to setting forth the salient development features as disclosed in the report of Mr. Graham Bell, the manager, we submit the following table, which analyses the outstanding figures of the year's underground operations:—

Shafts.	Total Footage.	Footage on Reef.	Payable Footage on Reef Sampled.	Reef Width.	Reef Value
North-West ...	12,682	6,484	3,964	26·3	1·4
North-East ...	9,974	7,701	4,177	24·5	14·5
South-East ...	2,532	470	320	44·5	19·8
South-West ...	578	37	30	52	7·1

Segregation of footage according to payable and unpayable zones is attempted in the following:—

	Payable Footage.	Width. ins.	Value. dwts.	Un-payable.	Width.	Value dwts.
North-West ...	3,964	26·3	11·4	3,964	14·2	5·9
North-East ...	4,177	24·5	14·5	3,083	13·9	6·4
South-East ...	320	44·5	19·8	110	56·1	0·8

It will be seen that the reef disclosures, although they have not so far established the possession of a very high grade mine by the company are on the whole satisfactory. The values shown last year should yield a fair margin of profit when the mine is operating a milling equipment commensurate with the big possibilities of the Modder Government Areas.

Leaching of Copper Ores in Africa.

The leaching of copper ores in Africa is now engaging considerable attention in American mining circles, where the possibilities of leaching processes for the recovery of copper from its ores are receiving most careful consideration. In regard to African practice an American contemporary remarks:—

> There (in Africa) also proposals once discarded are being brought forth and re-examined to see whether they cannot be so modified as to be applicable to present conditions. Sometimes they have been found impracticable, as at the Bwana M'Kubwa copper mine, in Northern Rhodesia, where it was proposed to erect a Siemens-Halske plant to recover the copper in the tailing from wet concentration. Various difficulties developed, chief among which is the discovery that the ore reserve was neither so large nor of so high a grade as expected. At the mine of the Bechuanaland Copper Company, also in Rhodesia, it is likewise proposed to use the Siemens-Halske process on the recommendation of Messrs. Hooper, Speak & Company. The Siemens-Halske process consists essentially of leaching the roasted ore with ferric sulphate solution, producing ferrous sulphate and copper sulphate. The solution is drawn off and electrolyzed, precipitating the copper. Though apparently simple, almost unsurmountable major difficulties arise, not to mention a number of annoying minor ones. It seems impossible to discover a satisfactory substance from which to make the anode, and in addition the ferrous sulphate is oxidized to ferric at the anode and reduced to ferrous sulphate again at the cathode, thus consuming much electrical energy to no purpose. This can be in part prevented by the use of a porous diaphragm, but this increases the resistance of the cell, and it is also difficult to find a satisfactory substance to form the diaphragm. The most important experiments made with this process in this country (America) were those made at the Ray mine by Mr. W. Y. Westervelt. . . . . The process has also been tried in Spain and elsewhere without success, and the results attained in Africa will therefore be awaited with interest. The most recent information is that the use of the Siemens-Halske process has been given up at the Bwana M'Kubwa, and it is now proposed to use the MacKay process, which has also been suggested as a possibility for the solution of the difficult metallurgical problem at the Tanganyika.

These views, coming from such an important and experienced cupriferous country as the United States, will no doubt be read with much interest by our technical friends in the north.

HAMMER DRILLS IN BARNATO MINES.

Excellent Results from the New Unified—Prof. Lawn's Significant Statement.

The average number of rock drills in use in mines of the Transvaal during February was 5,970, which is higher than the average in either January or December last, but at the same time the total time falls considerably below the average for the earlier months of last year, when over 6,200 were in use in the Transvaal. Evidently the rock drill has not thus far been used to any degree in the organised replacement of labour on the Rand, at any rate it is a feature worthy of note that a lesser number of natives employed on the mines is connoted by the employment of a lesser number of rock drills. However, there is at least a reasonable hope that in the near, if not the immediate future, that mechanical stopers will take the place of large numbers of mine boys. The re-organisation and selection of native labour depends in large degree on the invention and employment of a thoroughly economical stoping drill, and we may confidently expect that something almost tantamount to a revolution in underground mining practice on the Rand will result from the discovery and employment of the ideal stoping drill. We have recently accorded this subject considerable mention in the columns of this journal, as befits its dominant importance in the field of Rand mining economics. In the annual reports of two mines under Barnato control this aspect of the industry is given special heed to, and in regard to the results secured at the New Unified Prof. Lawn makes the important statement:—During the year some very interesting experiments were made with a new type of stope drill. The results obtained for the last three months of the year are tabulated in the manager's report, and are of a very satisfactory nature. Indeed, it is felt that they are so significant that the experiments may have an effect on future methods of stoping in many mines on the Rand. The results in question are stated by the New Unified Company's manager to be as follows:—Experiments have been carried out with the Atlas hammer machine on stoping work, and very encouraging results have been obtained so far. The machine is light, weighing about 75 lbs. It is too early to give reliable data with regard to the cost of upkeep, but there is no reason to think that it will be excessive. For the last three months of the year the stoping results obtained with the Atlas drill were as under:—Machine shifts, 231; fathoms broken, 275·6; fathoms per machine shift, 1·19; average stoping width, 45·68 ins.; tonnage broken, 3,148; tonnage per machine shift, 13·63. In a recent issue we gave a few particulars regarding the Atlas drill, and in the near future we hope to supplement these particulars by further data. It is important to note that the machine weighs only 75 lbs. and therefore comes under the "one man drill" category. The experience of the manager of the Ginsberg mine in regard to hammer drills is stated in the annual report as follows:—During the year experiments have been carried out with seven different types of hammer drills. Most of these proved to be unable satisfactorily to drill the unusually hard rock which is met with in the Ginsberg mine, but, as a result of our experiments, we have selected two drills, which, after sundry minor difficulties have been overcome, probably will give us results which may more closely approximate to those now obtained from hammer boys. If anything like an average tonnage of 13·63 per machine shift can be maintained by these drills the hope that they will give results "which may more closely approximate to those now obtained from hammer boys" may be regarded as a very modestly expressed anticipation. At the same time, until costs of maintenance have been determined over a lengthy period and other characteristics of the machines have been thoroughly investigated it would be unwise to enthuse too much on the future of Rand mining as affected by new types of machine drills.

THE HARRISDALE SYNDICATE'S TIN PROPERTY.

Inspection by Dr. Merensky—Geological Features—Promising Prospecting Results.

In our issue of March 21st last, we stated that the Harrisdale Syndicate had secured a tin property in the Waterberg, and as Mr. W. Bleloch, chairman of the Syndicate, has recently returned from the proposition, and also in view of the facts that during the past fortnight further exploratory work has been done on the proposition, and that Dr. Hans Merensky, the well-known geologist has reported on the tin-bearing possibilities of the area acquired, some further information as to the syndicate's new asset should be of interest.

General Geological Features.

The property in question is known as the Van Rooyen's portion of the farm Rietfontein, adjoining Rietfontein of the Transvaal Consolidated Land and Exploration Company and the Welgevonden Tin Mine under African Farms control. The main geological features to be observed on the Harrisdale Syndicate's ground are briefly as follows:—On the southern portion of the farm there occur the felsites and shales of the lower Waterberg formation and on the northern area the unconformable beds of the Upper Waterberg, consisting of sandstones and shales. A diabase dyke cuts through the property in roughly a north-west by south-east direction, and for all practical purposes the area may be considered as being divided into two portions. In the western section the Lower Waterberg beds widen out considerably and are much broader than they are to the east. Two main occurrences of cassiterite have been found on the farm. What is known as the No. 1 occurs in the felsites and close to the intrusive granites along the southern boundary of the farm. The No. 2 is a cassiterite bearing zone in the Lower Waterberg series and lying about 1,500 ft. to the north of No. 1. A section across the No. 2 zone shows, firstly, a white quartz reef, then 50 to 100 ft. to the north a tin-bearing zone in soft reddish shales, and further north a well defined band of hard shales. The formation is cut off by the diabase dyke. The whole section to the north of the dyke in the No. 2 zone runs from end to end of the property, about two miles in the north-eastern section. The No. 1 runs from the eastern boundary to the dyke.

Work Done to Date.

It may be mentioned that in the opinion of the directors of the syndicate the No. 2 section is regarded as being identical to that worked on Welgevonden. Now, as to the work done. Five trenches, extending over 700 ft., have been cut across the No. 1 line in the south-western section, exposing a lode from 2 to 6 ft. in width, and carrying good values. Some of the veins are very rich. This same lode has been opened up at two points in the eastern section, over a distance of 30 to 40 feet,, and where opened up satisfactory values have been found. One cross trench has been cut in the No. 2 western section. No work has so far been done on the No. 2 north-eastern section. Everywhere along this line loam carries good prospects. Dr. Merensky has just concluded a close examination of the property.

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THE CROWN MINES REDUCTION PLANT.

Tube Mills and Classification—Some Points Criticised.

[By a Correspondent.]

Through the kind invitation of the directors of the Crown Mines, Ltd., the members of the Chemical, Metallurgical and Mining Society had an instructive trip over this giant property last Saturday afternoon. I do not propose going into the details of the visit, but merely make a few comments on the surface arrangements as they appear to a metallurgical man. First of all, however, we will review the question of working costs. The directors of the Crown Mines can boast that of the three large mines on the big mill policy the Crown Mines have the lowest working costs. These mines and their costs per ton of ore milled are as follows:—East Rand Proprietary Mines, 21s. 11d.; Randfontein Central, 18s. 1d.; Crown Mines, 15s. 6d. No proof has yet been advanced that the big mill policy is an economical one. Several other mines, which are quite insignificant in size to the Crown Mines, can operate at the same or less cost than any of the large mines named. For instance, taking the Chamber of Mines figures again for February, the costs at the Glencairn mine are 12s. 1d., Knights Deep 12s., Modder B. 15s. 6d., New Primrose 13s., New Unified 15s. 6d., Simmer and Jack 13s., Simmer Deep 14s. 7d., and the Witwatersrand 14s. 2d. The new Crown Reef stamp mill is a splendid structure, and after the so-called innovations of the City Deep mill, which were concrete king posts and multiple cam shaft bearings, the reef mill is back again to wooden king posts and a cam shaft bearing on each king post. The tube mill plant there is roomy and well laid out, but it is difficult to see how a plant like this can compare in milling costs with the mill of the Simmer Deep, Ltd. At the Crown Reef mill the stamps crush to a 9-inch screen and the pulp flows to a centrifugal pump (No. 1 pump) where it is then lifted about 20 feet to the cone classifiers over the tube mills. A large feed is passed through each tube mill and a good quantity of rather coarse sand is to be seen passing over the primary amalgamating plates. All this pulp passes to a second pump (No. 2 pump) which is again lifted about 70 feet to an extensive system of cone classifiers (primary classifiers). No attempt is here made to get a mill underflow from these classifiers. The underflow from these classifiers then gravitates to a second set of classifiers over the finishing tube mills. After the pulp from these classifiers has passed through the tube mills it passes over the secondary amalgamating plates and gravitates to No. 2 pump to be again lifted to the primary classifiers above named. The overflow from these classifiers passes to the cyanide works. It will be seen that this plant has a set of tube mills for the coarse sand and another set of tube mills for the fine sand. Practically speaking, then, there are two circuits, and the claims for same are better classification. While I admit that classification for tube milling is better carried out in more cones than a single cone for each tube mill the double pumping idea is a wrong one. Two stage classification can be carried out with a single lift of the pulp and full amalgamation results obtained. A plant, therefore, after the style of the Simmer Deep, which does not necessarily require to be confined to a single cone classification system for each tube mill or partial amalgamation would in my opinion be more economical to operate than the Crown Reef mill. What is claimed for tandem tube milling at this plant is that 60 per cent. slime is produced, but obviously the cost of producing such a fine final pulp for cyaniding is out of the economical proportion to the cost of its production. The sand plant of the Crown Reef mill is the old style, namely, double tier tanks, the upper tanks being the settling tanks and the lower tanks the treatment tanks. The Corner House engineers have not yet found room for the Caldecott sand filter table. I understand the Butters' filter plant operates for less than 3d. per ton of dry slime treated. With such fine pulp as is produced here a very large gold extraction is obtained. In that connection the time is ripe for the annual review of methods, extraction obtained, and the costs of operating the metallurgical plants of the Rand.

NEW UNIFIED RECORDS SUBSTANTIAL PROGRESS.

Reduction in Costs the Outstanding Feature of the Year—Life of Mine Lengthened and Prospects Generally Improved.

The outstanding feature of the year's work at the New Unified has been the reduction in working costs. For 1912, the average cost per ton crushed was 21·269s., and this figure for 1913 was 17·622s., showing a reduction of 3s. 8d. per ton. This result was due to improvements in underground organisation, to the fact that about 13 per cent. of the ore mined was obtained from the upper part of the mine, and to the larger tonnage crushed. The policy of reducing the percentage of Main Reef Leader stoped, as outlined in the last annual report, was pursued, and though, as anticipated, the grade of ore milled was lowered, the reduction in costs enabled practically the same monthly profit to be maintained. The percentage of ore drawn from the Main Reef Leader was only 42·8 per cent. as compared with 62·29 per cent. in 1912. In his annual report the consulting engineer, Mr. J. G. Lawn, writes:—The reduction of costs is not only of immediate importance, in that it enables the monthly profits to be maintained whilst milling a much lower grade of ore than was formerly milled on the mine, but it will add to the life of the mine, as it will enable a considerable area of South Reef, formerly thought unpayable, to be mined at a profit, and patches of Main Reef will also be available that formerly it would not pay to work. The exploration of the upper levels of the mine has given gratifying results, and it is clear that a large tonnage of ore will be obtained from this source, which is not included in the ore reserves. The tons crushed for the year amounted to 147,390, an increase of 15,065 as compared with the previous year. The gross profit for the year was £60,069, which fell short of the profit for the previous year by only £565. As very little development work remained to be done on the Main Reef Leader, operations were directed mainly to the opening up of the South Reef. Encouraging values have been exposed in several sections of this reef, and it is probable that eventually a large percentage of the ore from this source will be mined at a profit. The ore reserves were re-estimated at the end of the year, and in view of the substantial reduction in working costs it was decided to include several blocks of ground which in the past were rejected as being below the pay limit. The payable reserves now stand at 387,500 milling tons of an estimated recovery value of 5·0 dwts. Mr. Lawn proceeds to deal with rock drill progress, and his remarks are dealt with elsewhere.

RESTRICTION OF DEVELOPMENT WORK.

An Analysis of Recent Returns—Slight Decrease on 1912 Ore Reserves Totals Likely—Mills Still Four Years Ahead of Requirements.

The total developed ore of the Witwatersrand at the end of 1913 is not yet possible to state, but it is a figure that is awaited with very considerable interest, since the operations of the past few months have been curtailed in regard to development as well as production as a result of the strike in July last, and the consequent disorganisation of the labour force. Reference to the monthly statement issued by the Mines Department shows that in February the development work carried out in the productive mines of the Witwatersrand was as follows:—In main drives and cross-cuts, 29,590 ft.; main shaft sinking, 1,606 ft.; other development, 17,337 ft.; total, 48,533 ft. As against this the amount of rock hoisted before sorting was 2,040,539 tons.

Monthly Totals.

Development figures for Rand gold mines only are not shown in their progressive totals month by month in the Department of Mines statistics, but the following record applying to all producing gold mines of the Transvaal for the past twelve months is interesting:—

	Development.			Average No. of Rock Drills in use.	Tons of Ore Hoisted before Sorting.
	Main Drives and Cross-cuts. feet.	Main Shaft Sinking. feet	Other Development. feet.		
Progressive Totals.					
1913—March	48.466	2,122	25,890	6,066	2,665,767
April	52,832	2,499	27,630	6,035	2,703,699
May	51,335	2,581	28,285	5.985	2,759,073
June	45,544	2,154	25,698	6,089	2,468,976
July	38.000	1,815	21,381	5,383	2,207,841
August	42,368	2,115	23,040	5,942	2,415,117
September	39,774	2,020	21,634	5,786	2,327,298
October	40,149	2,216	21,752	5,887	2,374,567
November	37.837	1,903	19,903	5,968	2,190,952
December	36,482	2,020	19,016	5,753	2,244,099
1914—January	30,990	1,693	15,166	5,073	2,191,986
February	36,351	1,887	18,323	5,836	2,118,363

A Study in Ratios.

In considering the influence of the recent strikes on the Rand's ore reserves, two figures have mainly to be borne in mind—(a) the total development achieved, and (b) the total tons of rock hoisted out of the mines. Both productive and development operations have been curtailed, but an important point that courts investigation is whether development work has sunk to a more restricted basis than crushing. The figures given above seem to indicate that this has been the case. Thus in March, 1913, there were between 34 and 35 tons of rock taken out of the mines for each foot of development work accomplished, whereas in February of this year nearly 38 tons were hauled from the mines for each foot of development. These figures seem to point to the fact that the ore milled has gained on the ore developed during the past twelve months. In other words the figures seem to indicate that there has, through stress of conditions, been some encroachment upon ore reserves. Until figures for all companies are available, it would be dangerous to dogmatise on this point, but it should be of much interest to examine comparative figures as to ore developed at the end of 1913 and at the end of 1914, as shown in the annual statements of some of the companies that have issued reports for last year.

A Few Companies Considered.

To consider some of the more important companies only, the Brakpan report discloses a shortfall of 215,000 tons, but on the other hand the Wit. Deep Company's stock of developed ore was 173,700 tons greater at the end of last year than at December 31st, 1912. Again, the East Rand Proprietary Mines' reserves are 400,000 tons less, but at Randfontein 6,818,929 tons of 27s. 7d. value at the end of 1913 compare with 6,350,781 tons assaying 28s. 10d. per ton at the end of 1912. Then again, in regard to the mines under the control of the Johannesburg Consolidated Investment Company, the Van Ryn Deep shows a very gratifying expansion in tonnage and improvement in average value, whereas one or two of the other subsidiaries show a contraction in regard to developed ore. These instances are typical of the Rand generally, and although no definite figures or even approximate figures as to the total payable ore reserves of the Witwatersrand at the end of the year are available, it seems reasonable to assume that the aggregate will be a little below the total at the end of 1912.

Last Year's Figures.

It may be recalled that about twelve months ago we estimated the ore reserves of the mines according to the various controlling houses or groups, only "payable," fully exposed, and fully valued tonnages being dealt with, except in one or two special instances, as under:—

Group.	No. of Mines.	Tons.
Central Mining & Investment Corporation	15	38,563,916
Consolidated Gold Fields of S. Africa	5	8,655,403
East Rand Proprietary Mines	1	6,013,000
Anglo-French Exploration Company	1	1,687,101
Consolidated Mines Selection	1	2,457,000
Randfontein-Langlaagte	2	8,970,639
General Mining and Finance Corporation	7	6,808,889
Johannesburg Consolidated Invest. Co.	8	6,740,909
S. Neumann & Co.	5	4,268,634
A. Goerz & Co.	4	2,721,500
Independent Company	1	500,471
	50	87,387,462

Group totals at the end of 1911 were:—

	Tons.
Central Mining and Investment Corporation	38,358,242
Consolidated Gold Fields of South Africa	9,199,000
East Rand Proprietary Mines	6,716,605
Anglo-French Group	1,753,370
General Mining and Finance Corporation	5,842,556
S. Neumann & Co.	4,183,962
Johannesburg Consolidated Investment Co.	5,814,231
Randfontein-Langlaagte Group	6,940,166
A. Goerz & Co.	1,949,207
Consolidated Mines Selection	1,925,346
	82,682,685

We then remarked: The grand total arrived at for the end of last year is, it will be observed, 87,387,462 tons, or getting on for five million tons in advance of the 1911 estimate. If to this total of eighty-seven and a-third million be added ore partially developed or partially valued, the great bulk of which may be assumed to be "payable," and there be also added the tonnages of pay rock awaiting mining in a few comparatively unimportant mines not included in the above, a grand total of about one hundred and ten million tons is arrived at.

Whilst the aggregate at the end of last year is likely to show some diminution, more particularly in regard to productive mines, the decline is not likely to be a very large one and the mills of the Rand should still possess tonnages about four years ahead of normal requirements.

Operations at the Copeton Diamond Mines are showing a renewed activity, according to the *Australian Mining Standard* of 4th December, 1913. An advance has been made in the price paid for local gems and returns are augmented by the sale of tin oxide inclusions. These New South Wales stones are similar to those from Brazil in their physical characteristics, and are stated to be largely sold as coming from there.

BIG PROFITS FROM ONE-AND-A-HALF DWT. ORE.

Some Facts About Profitable Crushing of Low Grade Ore in Large Quantities—Striking Object-Lesson for the Rand—Epoch-Making Developments in Mining and Metallurgy.

THE most dramatically interesting developments in the mining and metallurgy of precious metals are taking place back of Juneau, Alaska. A zone, about 20,000 ft. long by 1,000 ft. wide in its widest point, is being developed by three companies: the Alaska Gastineau, which owns about 12,000 ft. along the strip, the Alaska Juneau, which owns about 5,000 ft., and the Alaska Ebner, which owns 3,000 ft. This zone consists of a belt of slate in which quartz lenses and stringers occur with more or less irregularity. The gold contents in the pure quartz, that is, in the centre of lenses, are practically negligible, and the gold in the slate itself is also small in amount. The gold seems to occur chiefly at the contact between the quartz and the slate. Assays as high as $90 per ton for a width of 8 in. have been obtained, but a recovery of $1·50 is estimated for the whole mass that will be mined. Naturally, the method of mining such a deposit, and the costs that will be incurred in mining, have received a great amount of attention. In the case of Gastineau a system has been worked out which promises favourable results. The foot wall of the deposit, so far as developed in this property, is fairly well defined by the fact that quartz lenses and stringers occur with greater persistence and regularity on the foot wall than anywhere else. This wall dips approximately 55°, and it is estimated that the silicification of the slate extends out for an average of 35 ft. from the foot wall, although many of the crosscuts show a much greater width than this. A drive is carried parallel to the foot wall in the country rock. At a height of about 30 ft. above this drift a parallel drift is likewise carried in the foot wall. This upper drift is called a "chute-tender's drift." Crosscuts from it at intervals of from 30 to 50 ft. are driven into the vein. From these crosscuts, stopes are opened out 7 or 8 feet high and for the full width of the vein, say 35 feet, and the ore broken in these stopes is mucked into chutes which lead from the crosscuts to the working level. Stopes are then raised on the foot wall of the vein for from 20 to 25 feet high, and at the end of a stope, say 200 feet long, the vein is stoped clear across from the footwall for as great a distance as commercial recoveries are found. There is thus prepared a block of ground about 200 ft. long by 20 to 25 ft. high, which is undercut on the bottom, on the foot wall side, and at two ends, and experience has proved that this block of ground will cave. The roof that remains after it has dropped, gradually slabs off until it assumes a position approximately at right angles to the foot wall, when it is quite safe again for the men to enter on the top of the broken ground and start their foot-wall stope once more. Thus actually only one-fifth of the ore sent to mill has to be mined, the remaining four-fifths breaking itself.

Such statement seems like a fairy tale. It did to me when it was first made; but after having examined the stopes where some 400,000 tons has been broken by this method, I am inclined to believe, under the conditions existing, and with the amount of silicification of the slate so far exposed by development, that the scheme will work. Grizzlies are laid on top of the chutes before mentioned, and should these grizzlies become blocked by large lumps, the chute-tender going along the drift can in perfect safety bulldoze such lumps and keep the chute filled. These chutes are designed to hold 125 tons—approximately one trainload. The train will consist of flat cars and will be trammed either by endless wire rope, or by electric locomotive to the main chutes, where the ore will be plowed off the cars by a stationary plow and dropped to the Sheep Creek tunnel level. At the start, this drop will be some 1,400 ft., since the working of the mine will naturally commence at the part of the vein near the outcrop. The ore on the Sheep Creek tunnel level will be hauled in trains by electric locomotives to the mill, located on Gastineau Channel. In the mill the ore will be broken in crushers and rolls, and a large proportion roughed off, leaving only a small percentage to be finely ground, amalgamated and concentrated.

To most men familiar with gold mining, the crushing of gold ore with rolls is contrary to the vast bulk of experience. Rolls have been tried in the treatment of gold ore at many times, in many places, by many men, and so far with not sufficient success to warrant their installation on a large scale; but D. C. Jackling, who is responsible for the methods used in the Gastineau, is so confident, from the results of numerous experiments made with rolls, that they will be the best means of crushing for the particular class of ore found in the Gastineau, that $4,000,000 has been raised from the public to carry out his ideas on a large scale.

The Alaska Juneau has the maximum width of 1,000 feet on the slate belt. This company has driven a tunnel at an elevation of 350 feet above sea level, and has crosscut the belt in the tunnel, where it appears to be 700 feet wide; but owing to the fact that the tunnel cuts the belt at an angle, the actual width is about 500 feet. Owing to this great width, the Juneau cannot utilize the method adopted by the Gastineau, and will have to try some modification of a room-and-pillar method of stoping, combined with a caving process. At the start the ore will be supplied from a quarry at the surface. The broken ore will be scraped by Oregon scrapers into a rock house, where it will be coarsely crushed and sorted by hand. The sorted material will be dropped through a chute to the tunnel level and trammed to the mill, which will be likewise located on the Gastineau Channel. F. W. Bradley, who has had great experience in treating gold ores on Douglas Island, has decided to use stamps in the mill. Mr. Bradley expects to have a mill of a crushing capacity of 600 tons per day ready during the coming year. In front of the stamps he expects to instal machines which will carry out his flow sheet, as determined by the small experimental plant; but he realises that this flow sheet will in all probability have to be modified when working on a large scale. The main idea of the flow sheet is to crush the ore to such a fineness that a large proportion of it can be roughed off, leaving only a small percentage to be finely crushed, amalgamated and concentrated. The money for the work on the Alaska Juneau is being put up by Mr. Bradley and a few of his immediate acquaintances, for while he is reasonably sure from his long experience on Douglas Island that a large percentage of the gross return from this slate belt can be realised as profit, he is not sufficiently sure to ask the public to come in and subscribe the large amount of money that will be needed absolutely to demonstrate this fact.

It is the race between the two ideas in the metallurgy of gold ores, as represented in the Gastineau and the Juneau, which forms the dramatically interesting feature of the situation. The Ebner is driving a tunnel to develop its section of this slate belt, and it will be able to profit by the large amount of work done by the other two companies in determining which method of milling will yield the more economical result. The mills of all these companies will be on Gastineau Channel, and, while no serious menace to navigation has been produced so far by the milling on Douglas Island, when amounts of 6,000 to 20,000 tons per day shall be discharged into the channel, some other means than the mere wash of the tide will have to be utilised to get rid of the tailings. Probably tailing flumes two or three miles long will have to be provided to carry the tailings along the shore into deep water.—*Excerpts from a speech by Sidney J. Jennings before the Mining and Metallurgical Society of America.*

Nigel G.M. Co.

We are advised by the secretary of the Nigel Gold Mining Company, Ltd., that the following cable has been sent to London:—"Sufficient rain has fallen to relieve situation for a few months. Full plant again operating."

POSITION OF THE NATAL COAL INDUSTRY.

Statistics of the Extent, Output, Capital, Trade and Prospects of the Coal Mines of the Province.

From the mining point of view, the evidence on the coal industry was the most interesting of that given before the Dominions Commission in Natal. *Inter alia*, Mr. J. T. Williams, who appeared for the industry, stated that Mr. North reported, at the request of the Government, in 1881, on the Natal coalfields, and estimated 2,073 million tons of coal (after a deduction of 50 per cent.). This was exclusive of the new districts of Utrecht and Vryheid. The outputs from the commencement in 1889 to the end of 1913 have been 22 million tons, and the dividends paid from the commencement to the end of 1913 totalled £1,272,249. The share capital as at December 31, 1912, was: Ordinary shares, £2,396,188; preferred shares, £325,000; debentures outstanding, £330,653; temporary loans, £102,170. The coal trade is made up as follows:—

	Average for Four Years. Per Cent.	1913. Long Tons.
Bunkers	49	1,080,000
Exports	19	616,000
Railways and Harbours Department	14	415,000
Inland consumption	18	497,000
Totals	100	2,608,000

The annual output totals have been: 1910, 2,296,000 long tons; 1911, 2,394,000 long tons; 1912, 2,472,000 long tons; 1913, 2,608,000 long tons. The present collieries can increase their outputs 50 per cent. with a full and regular supply of rolling stock and adequate native labour. As the demand increases, new areas would be brought under exploitation. The chief exports are to the Cape Province, India, Straits Settlements, Dutch East Indies, Mauritius, Madagascar, and the East Coast of Africa. With cheaper freights and reduced railway rates there is a very large potential market in South America. Expansion must be looked for principally from an increase in the export trade. This largely depends on low rates. The recent reduction of 1s. 1½d. per long ton on export coal has been useful, but a larger reduction is required for the increasing volume of business. Expansion is also anticipated in bunkers from the increasing shipping trade between East and West, especially with Australia. Natal coal for bunkering is considerably cheaper shipped at Durban than when shipped at Capetown. At present the best coals at Durban are 17s. to 18s. 3d., trimmed into bunkers, as compared with 25s. to 26s. trimmed into bunkers at Capetown. Natal coal is less handled when bunkered at Durban than when shipped to Capetown to be bunkered at that port. Since 1910 a large number of new steamers, which call at Durban, have been built by important owners trading between the East and West, especially for the trade with the United Kingdom. Owing to the increasing size of the steamers, the question of bunkering en route is becoming more important. The prospective position of Durban as a coaling port is therefore bright, as large stocks of good coal at low prices may be relied upon. A policy of drawing settlers to the land would automatically expand all industries, and involve a largely increased demand for coal. The collieries average about 248 miles from the port, and the general rate is 6s. 8d. per 2,240 lbs. bunkers, with rebate of 1s. 1·44d. on coal exported as cargo. These rates are considered excessive, compared with the rates from Transvaal collieries to Capetown. A further reduction is required in the export rate to develop increased business, and in local rates, especially to Durban, for industrial purposes. Railway rates from Transvaal collieries to Lourenco Marques for local consumption are 1s. lower than to Durban for the same distance. This is not fair or reasonable.

"KNIGHTS" RECORD YEAR OF PROSPERITY.

Improved Grade and Extraction—Costs Stationary—Shortage of Native Labour—Development of Southern Section to be Resumed.

The Witwatersrand Company has had another prosperous year. It will be remembered that the profits made in 1912 formed a record for the mine, and these have been improved upon to the extent of £37,720. The total gross profit amounted to £269,114. The quantity of ore crushed was less by 8,450 tons, but working costs remained practically unchanged, and there was an increase of ·357 dwt. in the grade of the ore sent to the mill. The new tube mill plant was not started up until October, and the full benefit to be derived from the working of the plant is not reflected in the figures for the year. However, the average value of the residue for the twelve months has been reduced from ·521 dwt. to ·477 dwt.; for December the value of the final residue was ·262 dwt. Mr. J. G. Lawn, the consulting engineer, writes, *inter alia*:—The mine suffered severely from the shortage of native labour which ensued as a result of the unrest amongst the white employees. The July strike caused a certain amount of dislocation in the work of the mine, but the "suspended strike" which was declared a few weeks later had a most disquieting effect on the native mind, and large numbers of boys took their discharge at the earliest possible moment. The shortage became so acute that shaft sinking and development at the Southern Section had to be stopped, and work in other sections of the mine was also handicapped. It was found necessary, in order to keep the full mill running, to mine a disproportionate amount of footwall, which is below the average grade of the mine, and which naturally had an adverse effect on the yield. As an indication of how the returns were affected, it might be mentioned that the profits for the last six months of the year were £10,000 less than those for the first six months. However, since the beginning of 1914 native labour has been coming in more freely, and, as the industrial position generally has shown signs of considerable improvement, the outlook for the current year is most hopeful. The development of the Southern Section was pushed ahead during the first half of the year, and the reef disclosures were of a highly satisfactory character. It is intended to resume work at this section almost immediately. A re-calculation of the ore reserves which was made at the end of the year shows that the payable reserves amount to 1,225,688 milling tons of an estimated recovery value of 6·4 dwts.

Mr. F. B. Lewis, the manager, writes, *inter alia*:—110 stamps are now working on new concrete foundations, and are giving entire satisfaction. It is hoped to complete the foundations of the whole mill during the present year. A new 250 h.p. Babcock boiler has been installed, which has replaced the last five small Cornish boilers. The new tube mill plant and additions to the slimes plant came into operation in October last, and are giving satisfactory results. A 50,000 cub. ft. "Sirocco" ventilating fan was installed at the main shaft, which is giving very beneficial results as regards the better ventilation of the lower levels. During the year the Elsburg dam, which burst during the floods of 1909, has been repaired and equipped with a modern motor-driven pump. This dam will now hold 110,000,000 gallons, and should effectually insure the mine against any possible water shortage in the future. The capacity of the mill bins has been increased by 600 tons, which will greatly facilitate the running of the mill at week-ends.

POSITION OF THE UNITED JACK GOLD MINING CO., LTD.

Description of a Typical Developing Property in the Murchison Range.

The United Jack Gold Mining Company, Ltd., held an extraordinary general meeting on the 23rd ult. at their offices, Norwich Buildings, Church Square, Pretoria. In addition to a number of resident shareholders, the following directors were present: Mr. J. J. Kirkness, Mr. W. Nivinson, Mr. A. M. Campbell, jun., and the Chairman, Mr. John Jack. The total number of shares represented was 26,882, out of a capital of £45,000.

The Chairman explained that the meeting had been called for the purpose of considering an increase of the present capital, in order to provide machinery and start active working operations, in accordance with the scheme recommended to the shareholders by the board. Resolutions were unanimously adopted empowering the directors to create 15,000 seven per cent. cumulative preference shares of £1 each, which shall rank *pari passu* with the ordinary shares in a dividend in any one year in excess of the preferential dividend of seven per cent., after the ordinary shares have also received for such a year a dividend up to seven per cent.; the preferent right to subscribe for these shares belonged to the present registered shareholders. This company has been quietly but steadily and carefully developing their property, which is situated on the Antimony Belt of the Murchison Range, Zoutpansberg. On starting work they were faced with the difficulties pertaining to the district, the prevalence of malarial fever, difficulties of water supply and excessive transport charges. These have been overcome, in the matter of fever, by the erection of mosquito-proof houses for the staff, and there has been no case of fever on the mine. After trying various schemes, a sufficient supply of water was obtained from a shaft on the banks of a dry river on the property, which is estimated by Mr. Pope to give 1,000 gallons per hour, while an additional supply can be obtained from a borehole, also put down at the company's expense.

The Railway.

Since the company started prospecting, the Selati railway has been completed to Tzaneen, and a station has been opened within a mile of the property, thus bringing it 170 miles nearer the coast than Johannesburg. This facility will enable the company to effect a considerable saving in the cost of the machinery to be erected as compared with the former high transport rates. The company have a reef on their property averaging 3 feet wide, dipping northwards at an angle of 35 degrees. It traverses the company's claims for about four miles and runs almost east and west. In the middle of this length, about 800 yards have been developed down to the 100 ft. level., where a drive connects the various shafts. The ore in sight and at grass is sufficient to keep the mill running for close on two years, crushing at the rate of 50 tons per day, quite apart from further developments in length and depth. In the course of development the reef has been assayed every 5 feet in the shafts and drives, with values averaging 4½ dwts. gold and 12 per cent. antimony. Mr. W. T. Pope, M.I.M.M., examined the property on the 8th July last, and in the course of a favourable report gave the average value from 35 samples taken by him as 6 dwts. gold and 12½ per cent. antimony. He further stated that the facilities for working are such that the costs of milling, mining and cyaniding should not exceed 15s. per ton, and that profits could be looked for from the commencement of milling. On a most conservative estimate it is expected that the nett profit will be from 12s. to 15s. per ton. Native labour and timber are plentiful.

Metallurgical Process.

The directors have decided to adopt a process for dealing with the separation of the antimony from the gold, as patented by Mr. J. S. MacArthur, the originator of the cyanide process of gold recovery, which has proved such a success. Mr. MacArthur assures the directors that 90 per cent. of the gold and 80 per cent. of the antimony can be recovered. This has further been proved in the laboratory, and also from a bulk test of 10 tons. The difficulty of separating these two metals has hitherto hindered the profitable working of mines in this important gold field. The directors are meantime proceeding with the arrangements for the completion of their pumping plant, while the battery foundations are also being excavated, and efforts are being made to have the mill erected during the dry months of winter. We understand that the reef referred to extends for about 70 miles, so that the successful operations of this company should have an important bearing on the trade and business of the Murchison Range, and the pluck and exertions of the directors in overcoming the obstacles with which they were faced and bringing their company to the present stage are certain to bear fruit.

THE POSITION AT THE GLENCAIRN.

Points from the Annual Reports—Mine Completely Developed.

In his annual report on the Glencairn, Mr. J. G. Lawn, the consulting engineer, writes:—A normal scale of operations was maintained at the Glencairn mine during 1913, and the gross profit realised amounted to £32,201. This is less than the profit made in 1912 by £3,002, the reduction being accounted for entirely by the drop in the revenue from accumulated slime. There was an increase in the tonnage crushed of 4,083 tons, and working costs were reduced by fivepence per ton. The development of the mine is now practically completed. The ore reserves were re-calculated at the end of the year. A certain amount of caving has occurred in the western portion of the Glencairn section, and the ore in the caved portion has been eliminated from the reserves, although it is probable that much of it will eventually be recovered. It is estimated that the definitely payable reserves amount to 191,257 milling tons. There are in addition to this 793,326 tons of doubtful value, and, assuming that 50 per cent. of this tonnage will be payable, the ore reserves would amount to 587,920 milling tons of an estimated recovery value of 3·6 dwts. The manager, Mr. T. C. Bruce, says, *inter alia*:—As was the case the previous year, development work was chiefly confined to the Knights Tribute section, the development of which is practically finished. All the Bastard Reef exploited by development in this section, although of low grade, will be payable to work. 32,030 tons were mined from Knights Tribute during the year, and 15,740 tons from caved workings above the third level in the rest of the mine, including 1,530 tons of North Reef mined above the second level, Glencairn section. The latter is of very low grade, but is cheap to mine and crush. 93,780 tons were obtained from caved workings below the third level and from doubtful blocks. Much work has been done in opening up caved levels throughout the Glencairn section, from which a large tonnage of reef is being obtained. Approximately 10,000 tons of tailings and rock were packed in stopes beneath the railroad. This work is nearly completed. An average number of 6·88 large rock drills were in use for stoping during the year. The ore stoped by them was 35,180 tons. An average number of 2·88 large rock drills were in use on development during the year. The footage driven, risen and sunk by them was 1,591. Several Flottmann and air feed hammer drills were in use and gave good results.

ORCHARDING PROSPECTS IN TASMANIA.

Unique Opportunity for Men on the Mines—Mineral Prospects of Tasmania—Interview with Mr. J. P. Johnson.

Mining work, though well paid, is a strenuous occupation, and the follower of it must sooner or later retire to a less exacting mode of living. The problem of small holdings for miners is one that has often been discussed in these columns, while a desire to go on the land is frequent among those in the higher ranks of the profession. While our main concern is the purely commercial aspect of the industry, we, in common with its controllers, have always taken a deep interest in the welfare of the man behind it. It was from this point of view that we sought out Mr. J. P. Johnson at the Grand National Hotel in connection with the orcharding prospects in Tasmania, which he is at present advertising. Mr. Johnson has the advantage that he is well known to us, having been many years on the Rand, and author of "The Mineral Industry of Rhodesia" and other books dealing with South Africa. Moreover, he has settled with his family in Tasmania, having taken up orcharding in the Tamar Valley, and is thus able to give us first-hand information.

At the outset Mr. Johnson pointed out that, while the desire to get back to the land is very widespread, it does not seem to be always realised that ordinary farming, besides being the most uncertain and speculative of all callings, requires as much knowledge and experience as any other profession, and that it is futile for a man to expect to leave the business to which he has been trained and immediately turn himself into a successful *general farmer*. This is not the case, however, with certain specialised branches of farming, which have been reduced to a definite routine, and which can therefore be followed by anyone if situated in an area where they are being practised. These areas are, of course, comparatively limited.

Orcharding is one such specialised (and incidentally, very profitable) branch of agriculture, and is specially suited to those who are desirous of retiring from mining and going on the land, since it neither requires the experience necessary for general farming, nor does it so fully occupy one's time, there being frequent slack intervals, when boating, fishing and shooting may be indulged in. Further, it does not entail the isolation of ordinary farming life, the size of an orchard being relatively small and the number of neighbours correspondingly greater. Apple growing in Tasmania yields an average nett profit of £35 per acre when the trees are in full bearing.

In answer to our query as to the general features of Tasmania, climate, rainfall, etc., Mr. Johnson said that the island is totally different in most of those respects to the Australian mainland. It is mountainous in the interior, resembling the Highlands of Scotland, with snow (in winter) capped peaks and great lakes. The peripheral lowlands somewhat resemble the south-west of England, the climate being more genial. In the north the winters are much milder than in England, while the summers are never so hot as on the Australian mainland or in South Africa. The rivers are permanent in character, and do not dry up in the summer, and droughts are unknown. On the west coast the rainfall is excessive, while on the east coast it is barely sufficient. The great northern orcharding area, the Tamar Valley, has an average rainfall of 25 inches, well-distributed throughout the year. Owing to the clay subsoil, which is present throughout the greater part of the valley, irrigation during the dry weather is unnecessary, and is not practised.

At this point Mr. Johnson showed us a plan and albums of views of the Tamar Valley, and we were compelled to agree with him that there can be few places in the world so agreeable to live in. It is a long narrow valley extending from the sea to the city of Launceston, a distance of 40 miles. It is hemmed in by rugged hills, covered with virgin forest and encloses a magnificent navigable waterway, with jetties here and there. Between the hills and the river lie the existing orchard clearings. The main point, however, is what sort of an income can one obtain there, and the following is the substance of Mr. Johnson's reply to our question on this matter:—

"An orchard becomes self-supporting in the fifth year, and in the tenth year yields an average profit of £35 per acre, this in a place where the cost of living is as cheap as in England. The possibilities of even a small acreage are immense, and profits of £150 per acre are not unknown, but these are, of course, extreme cases. The time taken by the trees to come into bearing is the one disadvantage of orcharding. To obviate this, we have introduced a system by which the purchaser of land may have his orchard planted and brought to bearing under the supervision of the Government expert. The purchaser is thus able to remain at his occupation and need not take over until the orchard is in bearing. All blocks sold by us are inspected by the Government expert, and are accompanied by a satisfactory report from him.

"We recommend buying 45 acres, and planting 10, to allow for future expansion, but if the prospective orchardist cannot afford it, 15 is sufficient, ten to be planted and five to be kept for house, etc. The price is £6-£12 per acre, except for ground actually on the river's edge, which commands a fancy price and of which there is little left. The cost of clearing, planting, fencing and purchase of trees for 10 acres is approximately £200. The cost of upkeep to the fifth year is about £70 per annum. These monies, of course, are only required in instalments as the work progresses."

"How about mining in Tasmania?"

"There are, of course, some mines of world-wide importance there, notably the Mount Bischoff tin mine, the Mount Lyell copper mine, the Zeehan silver-lead mines, and many minor concerns all over the country, including one in the Tamar Valley—the Tasmania gold mine—which has yielded £700,000 in dividends on a very small capital—I cannot recollect the exact amount just now. There are a number of new concerns of great promise being opened up. The geological conditions are very favourable to the occurrence of ore-bodies, but prospecting is difficult owing to the mountainous nature of the country and the dense forest.

"Asked if he could give any further information on the orcharding, Mr. Johnson supplied us with the following note:

"The pioneers of this orcharding development upon the banks of the Tamar are abundantly satisfied with the results of their few years' work. The output, which is now beginning to make a sensible increase, is of the finest quality. It is the admiration of all experts who have seen it, and every consignment that has gone forward has realised very satisfactory prices. All sorts and conditions of capitalists are embarking in it. Men in regular city employment are investing their savings in apple plantations, sometimes singly on a small scale or as members of a syndicate. Larger capitalists are also pursuing the profit that can be made by the growth of apples.

"Already nearly all the river frontage is taken up, and the banks dotted with splendid homes. My firm is managing for over 40 absentee owners. The settlers are of a very fine class, largely retired Anglo-Indians, but people are coming from all parts of the world. On the estate on which I am located, the adjoining ground on one side is owned by a South Africa, that on the other side by a young Melbournian, Beyond the latter's block are two owned by an Englishman and Scotsman respectively. Two other blocks near by are owned by a Tasmanian and an Adelaide gentleman respectively, the rest of the blocks belonging to Anglo-Indians. To my knowledge there are three British Columbians in other parts of the valley, and it is satisfactory to note that they consider the Tamar Valley to be superior to that great apple-growing country.

"I doubt very much whether there is any other part of the world where one can obtain apple-growing land right on a magnificent navigable waterway at the price, certainly there is none which combines in addition such delightful climatic, scenic and social conditions."

EXCELLENT SHOWING AT THE VAN RYN DEEP.

1,660,767 Milling Tons of 10·1 dwt. Ore Developed—Substantial Improvement on Last Year—Bright Prospects.

In the course of his annual report on the Van Ryn Deep, the consulting engineer, Mr. J. G. Lawn, writes:—Several factors tended to restrict the scale of operations, but the results obtained were of a most encouraging nature, and hold out promise of better things in the future. The quantity of ore crushed amounted to 182,000 tons, and the actual recovery value averaged 7·382 dwts. About 20 per cent. of the rock milled was obtained from the surface dumps, and included a proportion of low grade development rock. This accounts for the smallness of the recovery value as compared with the ascertained value of the ore reserves. The average working costs per ton were 19·906 shillings. They were naturally higher than will be the case when the plant is working at its full capacity. A total gross profit of £105,022 was realised, which permitted of the payment at the end of the year of an initial dividend of 7½ per cent. The industrial troubles which occurred in the middle of the year, combined with the unsatisfactory nature of the settlement arrived at, affected the Van Ryn Deep to a greater extent than any of the other mines of the group. The original dispute started in the district in which the property is situated, and there is no doubt that this proximity had a considerable influence on both the surface and underground workmen. Throughout the remainder of the year the defiant attitude adopted by the men rendered the smooth running of the mine a matter of considerable difficulty, and this certainly did not tend towards the highest efficiency. However, the strike which occurred early in this year has ended much more satisfactorily than did the previous one, and there is every indication that work will be carried on under more satisfactory conditions in the future. The development of the mine has been attended with gratifying results, and large blocks of high grade reef have been added to the ore reserves. At the east shaft the fifth and sixth levels, both east and west, have been extended in reef of excellent value. The ground has also been proved further to the south by two winzes sunk from the sixth level, and in both winzes reef of good grade has been exposed. A careful investigation was made of the position of the ore reserves at the end of the year. It it estimated that the payable reserves amount to 1,953,845 stoping tons of an assay value of 8·6 dwts. This tonnage is on the basis of an average stoping width of 55 inches. Allowing for 15 per cent. sorting, the milling tonnage stands at 1,660,767 tons of an assay value of 10·1 dwts. We have not yet sufficient data on which to calculate the recovery value, but I do not think this figure should be less than 35s. per ton milled. It will be seen that, as compared with the position at the end of 1912, there has been an increase in the milling tonnage of 574,464 tons, and an improvement in the assay value of 1·7 dwts.

REGULAR RETURNS THE FEATURE OF THE NEW PRIMROSE YEAR

Valuable Patches of Reef Exposed—Reclamation Yields Large Amount of Ore—Sorting Dispensed With.

The returns from the New Primrose mine for 1913 have been marked by considerable regularity. A high rate of profit has been maintained, and the gross profit for the year, viz., £218,313, only fell short of that for 1912 by £2,506. As the richer stopes become worked out, however, the tendency is for the grade to go lower, and the average value of the ore crushed in 1913 was less than that for the preceding year by ·372 dwt. As against this, there was an increase of 6,800 tons in the quantity of ore milled, and working costs were reduced by fourpence per ton. There was also a decided improvement in the extraction, due to the running of the tube mills, and the final residue was reduced to ·248 dwt. as compared with ·559 dwt. for 1912. The revenue from treatment of accumulated slime was considerably reduced, the profit from this source only amounting to £3,560, as compared with £13,722 for the previous year. It is estimated that the quantity of slime still available for treatment is in the neighbourhood of 6,000 tons. In his annual report, the consulting engineer, Mr. J. G. Lawn, writes:—It will have been noticed from the quarterly reports that sorting has been gradually reduced in amount until at the present time none is done. This is due to several causes, the principal being the reduced stoping width in the mine, and the large amount of ore which is being got from reclamation. The amount of payable ore exposed by actual driving on reef was comparatively small, but exploratory work in the older sections of the mine resulted in the discovery of considerable patches of reef showing good values. A certain amount of development was carried out on the southern series, but the values were low, and it was possible to include in the payable ore reserves only a small quantity of ore from this series. A re-estimation of the ore reserves was made at the end of the year, and it was calculated that the payable tonnage amounted to 401,045 milling tons of an estimated recovery value of 6·2 dwts. As will be seen from the manager's report, the ore obtained from reclamation during 1913 was 51·27 per cent. of the total tonnage milled. This figure shows what a considerable influence the working of the old stopes has had in extending the life of the mine. There is a good deal of reclamation still to be done, but, as much of the ore to be obtained from this source is of a lower value than the grade of the ascertained ore reserves, it is not anticipated that the recovery value will be so high as that during the past year, and consequently there is a likelihood of a reduction in future monthly profits. Mr. J. L. van Eyssen, the manager, writes, *inter alia*:—In last year's report mention was made of an addition to the reduction plant of two tube mills and classifying cones at a cost of £10,000, and it was hoped that a reduction in residues would result. The additions worked satisfactorily throughout the past year, and the following improvements can now be recorded:—(a) The total average residue was reduced from ·559 dwt. to ·248 dwt.; (b) the total extraction improved from 92·164 per cent. to 96·70 per cent.; (c) an actual cash profit of £10,644 resulted. The mine's labour strength was adequate for the first half of the year, but was adversely affected by the July strike of white miners. The year commenced with 1,788 natives in the compound, and ended with 1,527. The average number of native labourers during the year was 1,664. The death-rate from sickness was 9·61 per thousand per annum, and from accident 1·80 per thousand per annum.

French Bobs.

Mr. Richard Currie will sell by public auction at his Mart, 112 Commissioner Street, Johannesburg, on Monday, 20th April, 1914, at 11 a.m., the whole of the above property at Louws Creek, Barberton, consisting of 275 claims on Government ground, 2 water-rights, plant, machinery, buildings, and movables, a full inventory of which can be seen at the auctioneer's office.

THE LABOUR PARTY AND TAXATION OF LAND VALUES.

Leader Describes Policy of the Party in Regard to Taxing Land—Lines Upon Which Legislation is Now Being Drafted.

The policy of the Labour Party in the Transvaal in regard to the taxation of land was recently described by the leader of the party, Mr. F. A. W. Lucas, in the form of a Minority Report of the Small Holdings Commission. *Inter alia*, Mr. Lucas wrote:—

One of the grounds given for establishing small holdings is that they may possibly cause a reduction in the cost of living. That result will not assist the men for whom small holdings are required—those who suffer from low wages and uncertain employment. The worker does not, under present conditions, get the advantage of a reduction in the price of commodities because it is, as a rule, accompanied by a corresponding reduction in wages. The worker rightly claims that he has little interest in the question of the reduction of the cost of living until he becomes so independent economically that he can command the old wages while securing that reduction. The remedy which will meet the evils of low wages and uncertain employment must be one which will enable the "persons engaged in mining and industrial occupations" and in fact all workers, to reach a higher stage of economic independence than they now occupy. A system of doles in the form of small holdings will not secure that result. That remedy I find in the taxation of the value of all land, mineral, urban and agricultural, without exception and without graduation.

VALUE OF LAND.

By "value of land" is meant the value of any plot of land, exclusive of any value due to the expenditure of labour or capital by any person or body of persons other than a public body such as the State, a Provincial, Divisional or Municipal Council. Thus the land value of a farm would be the value of such farm, exclusive of the value of all dams, irrigation works, buildings, crops ploughing, manuring and any other works executed on it by the owner or tenant, but inclusive of any value added as a result of public works, such as bridges, public irrigation works, public roads, railways, schools and so on. It is obvious that the value does not depend upon the size of the particular plot of land. One-sixteenth of an acre of land in the centre of Johannesburg is of greater value than many a farm of several thousand acres. By value of land is therefore meant, in short, the value of the land at the time of valuation, assuming it to be in the state in which nature left it, with any value added through the work of some public body. Such a value is entirely created by the people as a whole and exists quite independently of the industry and capital of the owner. Land has the same value whether the owner is living on it or living in Europe. Any value which is due to the presence and work of the owner on the land is an improvement value and will *ex hypothesi* be exempt from the tax. From the nature of land values it follows that a tax upon them is not a tax upon industry. Such a tax is the assumption by the community of a value created and maintained entirely by the community. The present system of the private ownership of land, without any corresponding obligation upon the owner to pay to the community the annual value of such land, is the direct cause of the poverty and unemployment and insecurity of employment which are now expressing themselves in various ways, including the desire for small holdings. That system involves a direct violation of the equal right to live of all the people in South Africa. It gives a comparatively small number of people the power to say where and on what conditions the remainder shall live. Owners of mining, farming or building land can, even if they are not working such land, say whether miners, farmers or builders shall work it or not, and can determine the circumstances in which they shall be allowed to work.

ABUNDANT LAND AVAILABLE.

We found in the three mining districts of Johannesburg, Boksburg and Krugersdorp abundant land suitable for small holdings. We found also a large number of persons desirous of taking up farming, and we further found large numbers who wished to secure residential plots on which they could do gardening in their spare time. Those people are prevented from working in the way they wish because of our existing system of uncontrolled land owning. Instead of becoming or continuing to be farmers, they have been driven into the mining and industrial centres, there to compete with the workers in other occupations, manual and clerical. Those workers are twice injured. In the first place the number of people requiring their services is diminished, that reduces the number of openings for employment. Secondly, they are faced with competition from those would be farmers in the employment they already have. Similar results follow from the locking up of mining and building land. Those who wish to engage in mining and building occupations are prevented from doing so, and, as they must work to secure the necessaries of life, they are compelled to compete with those who are engaged in other work. The resulting poverty and unemployment demand our serious attention. One of the proposed remedies is the provision of small holdings. The mere provision of small holdings for those desirous of having them would not in itself have a very great effect on those evils. If everyone who wishes to be a farmer is given a plot of land, while existing conditions remain otherwise unchanged, little of any importance will have been achieved. The conditions which have created the present class for whom small holdings are to be provided, would very soon produce again a similar class. Doles of land under our present land system will produce no better results than doles of money. Holding these views, I cannot see my way to recommend measures which I am satisfied would produce no permanent improvement.

GRADUATED LAND TAXES CONDEMNED.

The majority of four Commissioners recommend the system of graduated taxation of land values to be applied only to land outside municipal areas and to exclude mineral values. I cannot agree to any of those limitations. The mere distribution of land among a larger number of persons than the present land owners will not be of great value. There must accompany the right to hold land an obligation to compensate other members of the community for that privilege. The tendency in the owner of a small plot of land to hold it for a rise is as strong as in the owner of millions of acres.

TAXATION OF MINERAL LAND VALUES.

There seems to be no adequate reason for excluding the mineral value of land from the operation of the proposed taxation. There is no justification for allowing the owner of mineralised land, if he is not himself working it, to prevent other people from working upon such land. That contention was adopted in principle in the Transvaal Precious and Base Metals Act, 1908, section 127, which provides a penalty in certain cases where the holder of a mining title, after once beginning to work his land, ceases to do so. The procedure there laid down is cumbersome. The taxation of the value of mining land would be far more effective and would be continuous in its operation. It would, by creating fresh openings for miners, reduce the amount of unemployment now existing. The consequent fillip to all industry would markedly increase the power of those employed in the mining and industrial centres to provide for themselves on small holdings.

LAND IN MUNICIPAL AREAS.

The Commission made a very wide inspection of the land within the three mining districts of Johannesburg, Boksburg and Krugersdorp. It was then shown that in all the municipal areas within these districts there is an abundance of land suitable for garden holdings. The Township Owners' Association stated, in evidence, that there are in proclaimed townships alone, within a distance of three miles from the Reef, between 40,000 and 50,000 unsold stands. In addition to this large area, most of which is admirably situated for garden holdings, there are extensive tracts of suitable vacant land which is not included in any proclaimed township. In these municipal areas there are three classes of land, township, agricultural and mining land. Township land, together with all buildings thereon, is rateable. Agricultural land is, by virtue of the Local Authorities Rating Ordinance (Transvaal) of 1912, rateable only on its agricultural value, and buildings are rateable only in so far as they enhance the value of the land for agricultural purposes. Mining or proclaimed land is not rated except in so far as it is used for purposes which are not incidental to mining. Township land cannot be said to be available for garden holdings because, as shown by my colleagues in their report, the price is too high.

EFFECT OF TAXING LAND.

A change of the rating system of municipalities in the Transvaal, from that of rating improvements and exempting those who lock up their land, to one of rating at its full value the land only, would in a very short time make the holding up of land in municipal areas unprofitable. It would render available sufficient suitable land to satisfy the present and any future demand for garden holdings in the municipal areas contained in the three mining districts to which the Commission's enquiry is confined. In this connection the changes in existing laws which I recommend are: (1) The rating laws applicable to the municipal areas within the three mining districts of Johannesburg, Boksburg and Krugersdorp, should be amended to make it compulsory upon the Municipal Councils having control in those areas to levy rates on the full value of all land, and to exempt all private improvements within such areas. (2) Repeal of the provisions in the Local Authorities Rating Ordinance (Transvaal) of 1912, exempting agricultural land wholly or partially from rating. (3) Repeal of the provisions of that Ordinance which exempt the value, whether present or reversionary, of proclaimed ground.

The best "Reef Traveller" is the *South African Mining Journal*.

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GRATIFYING PROGRESS AT THE CONSOLIDATED LANGLAAGTE.

Increased Profit and Reduced Costs—Improved Ore Reserves—Shaft Sinking to be Accelerated.

THE year's operations at the Consolidated Langlaagte Mines have been gratifying, and as a result the company has at last taken its place amongst the dividend-paying mines of the Rand. As compared with the previous year, there was an increase of 228,028 tons in the quantity of ore milled; working costs were reduced by 1·446 shillings per ton; and the gross profit realised, viz., £252,333, showed an improvement of £128,394. The new plant ran satisfactorily throughout the year, and the average value of the residues has been reduced to ·223 dwt. In this connection, it may be noted that the grade of the ore sent to the mill was ·07 dwt. lower than that crushed in 1912, but owing to the improved methods of extraction the recovery value was a shilling per ton higher. The consulting engineer, in his annual report, writes:—

The development of the mine has exposed ore of satisfactory value. A small amount of work was done in the western side of the Star (Outcrop) section, but the bulk of the development was carried out at the southern section. Here large bodies of payable reef—both South Reef and Main Reef Leader—have been opened up between the west and east shafts, and also to the east of the east shaft. Very little work was done to the west of the west shaft, where values are known to be poorer. The east shaft was sunk 263 feet, to an inclined depth of 2,965 feet, and the west shaft 41 feet, to an inclined depth of 2,640 feet. Both shafts are well ahead so far as the immediate requirements of the mine are concerned; still it is desirable that the speed of shaft sinking during the current year should be accelerated. The industrial disturbances which were general throughout the Rand in the middle of the year had a considerable effect on the Consolidated Langlaagte Mines. Apart from the actual loss of profit which ensued from the hanging up of the mill, the trouble had an unsettling effect on the native mind, and an exodus of natives on a large scale started immediately on the occurrence of the July strike, and continued for some months. From the resumption of operations in July right up to the end of the year the mine suffered from a considerable shortage of native labour, and it was found impossible to keep the mill fully supplied with ore. It was apparent, also, that a spirit of unrest prevailed amongst the white employees, and this did not conduce to the best results being obtained. It is generally felt, however, that the second strike which occurred recently has had the effect of clearing the air, and it is hoped that normal conditions will again prevail, and that work will be carried on smoothly for a long time to come. During the year 498,174 tons were taken from the ore reserves, whilst 529,396 tons have been developed. It has been thought wise to raise the unit of payability from 4 dwts. to 4·5 dwts. A careful revision of the ore reserves was made at the end of the year, and the results may be classified as follows:—

OUTCROP SECTION.

	Tons.	Width. Inches.	Value. Dwts.	Per cent. Tl. tonnage.
Crœsus				
Main Reef Leader ...	7,470	48·0	8·8	·35
South Reef	33,612	45·0	6·8	1·53
Star—				
Main Reef Leader ..	5,595	49·4	6·7	·25
South Reef	258.306	42·7	7·4	11·77
SOUTHERN SECTION.				
West—				
Main Reef Leader .	81,965	48·3	5·8	3·73
South Reef	284,362	43·4	6·7	12·96
East—				
Main Reef Leader ...	623,435	50·3	7·3	28·41
South Reef .	899,663	45·8	7·7	41·00
Totals and averages	2,194,408	46·3	7·4	100·00

The ore exposed in all sections under the value of 4·5 dwts. stands at 1,319.283 tons, averaging 2·7 dwts. over 47·4 inches. From the above, it will be seen that the payable reserves have a mine stoping value of 7·4 dwts., which it is expected will give a recovery value of 6·4 dwts.

The manager, Mr. A. E. Payne, writes, *inter alia*:—

During the year 17,819 feet of development has been done in the mine, of which 9,795 feet of driving has been on the reef, and 59 per cent. of this exposed payable ore. In the Crœsus section the eighth Main Reef Leader drive was driven westwards and connected with the Star section. Several boreholes were put in to prospect the Main Reef Leader in this area, with only one promising result, which will require further prospecting. In the Star section driving on the fifth level, South Reef, was continued, and this drive is now only 150 feet from the western boundary. The values were good. Development on the eleventh Main Reef Leader west drive, together with the rising and winzing from the tenth level, was so unsatisfactory in value, that work was suspended when labour shortage became acute. Driving on the twelfth South Reef west was continued throughout the year. The reef picked up below the Ferreira dyke carried satisfactory values. In the east shaft, southern section, development was carried out on all levels from the first to ninth inclusive. A rise from the first level, South Reef east, which connected with the air shaft from surface, exposed over 400 feet of South Reef above this level to the contact with the Ferreira dyke. On the fifth level, Main Reef Leader, east drive, the Main Reef has been exposed over some distance, and promises to be payable over a large area. In the eighth level, Main Reef Leader, west drive, the main fault, which in the upper levels separated the east from the west shaft workings, was encountered some 250 feet only to the west of the east shaft. Upon driving through the fault, South Reef was picked up, and the drive is being pushed ahead to connect with the eighth east South Reef drive from the west shaft. There are only two more connections to make to complete the development on the plane of the reef down to the fifth level. Between the fifth and seventh levels three areas are being stoped, whilst three other connections have been completed. Between the seventh and eighth levels one connection is completed. In the west shaft, southern section, development was carried out from fourth to ninth levels, exclusive of the seventh level. On the fifth level, South Reef, east drive, a crosscut was put in to connect with a Main Reef Leader rise from the sixth level, and the Main Reef Leader, on being found to carry payable values, was driven on at this level eastwards and westwards. In the latter direction the result was disappointing, whilst eastwards, although much faulted, there was a considerable area of payable ore exposed. On the eighth level, South Reef, east drive, a crosscut was put in to Main Reef Leader, and a rise started to connect with a winze from sixth level. The connection is not completed. Both South Reef and Main Reef Leader at this level have been disappointing in value, though showing a slight improvement at the year end. During the year sorting was systematically undertaken at the crusher station, and 29,198 tons of waste, equivalent to 5·287 per cent., and carrying an average value of 0·47 dwt., were sorted out and discarded. Much of the waste rock was trammed and used for the refilling of the outcrop workings. This added somewhat to the cost of sorting operations, which, taking into account the fact that a considerable quantity of dump rock has been trammed to mill, has proved a beneficial operation during the year.

New Mining Concession in the Belgian Congo.

H.M. Minister at Brussels reports that the Belgian Colonial Council has unanimously agreed to a draft decree approving a Convention concluded between the Government of the Belgian Congo and the Kasai Company, whereby the latter is granted, until December 31, 1918, and under certain conditions, the exclusive right of prospecting for minerals in the basins of the Aruwimi and Ituri rivers, together with the eventual right of working any deposits discovered. According to the *Board of Trade Journal*, the ceded districts are known to contain deposits of gold, and H.M. Minister suggests that the Kasai Company has good reasons for hoping that, in spite of the somewhat meagre results so far obtained in the valley of the Nebula river, it will find gold in paying quantities as in the case of the neighbouring Kilo Mines. At the suggestion of a member of the Council, a clause is to be inserted in this and all future mining concessions reserving to the Belgian Government, or to some institution designated by them, the right of pre-emption on equal terms with other applicants on all the gold ore produced, and at the ruling market price. The object of this clause is to create a free gold market in Belgium, with a view to increasing the gold reserve in the National Bank and thereby improving the monetary situation of the country.

Apple Growing in Tasmania.

Orcharding in Tasmania is a long-proved investment, giving a net return of about £35 per acre—equal to 50 per cent. per annum on capital invested—when orchard is in full bearing. Owing to the fine climate, lovely scenery and pleasant social conditions, it is particularly suitable for those contemplating retiring from mining work. We plant and manage for absentee owners, with extended payments, under Government expert supervision. We are managing for over 40 absentee owners, many of whom have visited Tasmania and have personally investigated the industry and our absentee system. Land situated on fine navigable waterway. Pamphlets, giving full particulars as to capital required, profits, etc., forwarded on application to our representative, Mr. J. P. Johnson (for many years on the Rand, and now settled on our Kelso Estate), who can be interviewed at the Grand National Hotel, Rissik Street, Johannesburg.—Messrs. Sadleir & Knight, Orchard Agents and Attorneys, Launceston, Tasmania.

DISCOURAGING OUTLOOK AT THE NEW RIETFONTEIN.

Contemplated Scheme for Working on Much Reduced Scale.

In his annual report on the New Rietfontein, Mr. J. G. Lawn, the consulting engineer, writes:—

The prospects at this mine did not look particularly bright at any time during the past twelve months, and towards the close of the year the grade fell away to such an extent that December operations were carried on at a loss. The value of the gold recovered during 1913 was over 4s. per ton less than that for 1912. The quantity of ore milled was only reduced by 3,517 tons, and fortunately there was a saving in working costs to the extent of 1s. 8d. per ton. The gross profit, at £19,857, showed a reduction of £25,[illegible]15. The sinking of No. 1 shaft was carried on with slight interruptions, and the footage accomplished amounted to 215 feet. At the end of the year the shaft had attained an inclined depth of 1,[illegible] feet. Development at this point and in other sections of the mine was not neglected, but unfortunately only a limited quantity of payable ore was exposed. In view of the discouraging outlook, it is felt that it would not be wise to continue running the mine on the present scale of operations, and a scheme for working on a much reduced scale is at present under consideration. The payable ore reserves in the mine at the end of the year were estimated to amount to 51,737 milling tons of an assay value of 7·55 dwts.

Mr. C. Marx, Junr., the manager, concludes his annual report as follows:—

The station and ore bin at the 14th level, No. 1 shaft, were completed, as well as the cutting of the ore bin and station at the 15th level. The reclamation work at No. 3 shaft is practically finished, and all the ore in the old stopes of No. 4 shaft has been mined. Development in the lower levels of No. 1 shaft has proved as difficult as during the preceding year, the faulting showing no signs of diminshing.

THE YEAR WITH THE GINSBERG.

Gross Profit £72,811—Lower Grade of Ore Crushed—Profits from Treatment of Accumulated Slime—Native Labour Shortage Felt.

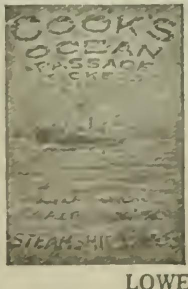
At the Ginsberg the year's operations have resulted in a gross profit of £72,811 being realised. This is £10,637 less than the profit for 1912. The tonnage crushed was increased by 8,175 tons, and working costs were reduced by over ninepence per ton. As against this, the grade of the ore milled was of lower value, being 6·898 dwts. as compared with 7·582 dwts. for 1912. The plant which has been erected for the treatment of accumulated slime was put to work about the end of September, and a profit of £498 has been realised from this source. This figure should show a substantial improvement during 1914. In his annual report, the consulting engineer, Mr. J. G. Lawn, writes:- The principal development work accomplished during the year was the driving of the ninth level east from the north shaft. This drive was extended a distance of 1,152 feet, and continued in reef throughout. The crosscut to the tenth level east was started, and it is anticipated that the reef will be intersected at an early date. This is the bottom level of the northern section of the mine, the reef being cut off below this point by the East Rand dyke. The reef exposed by the development has proved quite satisfactory both as regards area and value. A re-calculation of the ore reserves was made at the end of the year, and it is estimated that the payable reserves amount to 312,540 milling tons of an estimated recovery value of 6·0 dwts. The manager, Mr. Erroll Hay, in his annual report, writes, *inter alia*, as follows:

With the object of still further improving the ventilation conditions in the [illegible] portion of the mine, a small shaft west of the north shaft was opened up and re-timbered, and a 30 inch Sirocco fan, with a motor for driving same, was erected and housed at this point. Considerable work in the way of constructing ventilating doors, crossings and stoppings was carried out underground, and, at the present time, the ventilation is most satisfactory. A new slime dam was constructed on ground ceded to us by the courtesy of the East Rand Proprietary Mines, Ltd. This dam is of large size and should be capable of meeting our requirements up to the end of the life of the mine. The position as regards native labour was very good during the earlier part of the year. Owing, however, to the cessation of recruiting operations at a critical time in the year while the strike was in progress, the native labour complement fell away rapidly until the mine was seriously handicapped, being, at the end of the year, approximately 700 natives short of its complement.

Some interesting remarks by Mr. Hay on rock drills are dealt with elsewhere in this issue.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.



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Sakalava Madagascar Proprietary Oil Fields

To the Editor, *South African Mining Journal.*

Sir,—We have received cable advice that Mr. S. A. R. Skertchly, M.Inst.M.M., resident geologist, engineer and field manager of the company, sailed from Marseilles on the 19th instant, and is due at Tahanarive on the 11th April. Mr. Skertchly has with his four competent drillers. Mr. Skertchly is a man of wide experience with a most successful record. The last property of which is was in charge belonged to an English company and was situated in Mexico. Mr. Skertchly located all the wells which were drilled under his superintendence. The wells were drilled to a depth of 1,800 feet and were gushers under heavy gas pressure. Asking you to give publicity to the above.—Yours, etc.,

C. W. TAYLOR, Secy.

Johannesburg, 30th March, 1914.

What's Wrong with South African Mining?

A SPIRITED REPLY TO "CONSULTING ENGINEER."

To the Editor, *South African Mining Journal.*

Sir,—In your last (I think) series of papers entitled "What is Wrong with South African Mining?" appears an article purporting to be the opinion of "a well-known consulting engineer of one of the large companies." In it this gentleman makes some most offensive remarks regarding the prospector. As a prospector let me take up the gauge of battle in his defence. The consulting engineer states that the average prospector "has little knowledge to guide him, and many vices to handicap him." To this I reply that the prospector cannot help acquiring a knowledge of the formation of rocks, and the deposition of minerals, as he is associated constantly with them; and he possesses reasoning powers in a like degree with consulting engineers. The prospector is charged by this gentleman as being a confirmed boozer. How that can be I cannot conceive, seeing that his work generally takes him to uncivilized countries where stores and bars do not exist. The "bars" he most often gets acquainted with, and of which he has a most thorough knowledge, are the bars of the country he is prospecting—the hard, dry, and usually lofty "indicators" to the mineral chutes, without a drink of water on their summits. Geology is not an essential mental equipment of a prospector. The geologist is a theorist, and the prospector cannot afford to theorise to any extent; he has not the time or means, and if he is employed by anyone, he is expected to "get a move on" and "find," or he is pretty soon told he is not wanted: that is my experience. If he is "on his own," stern necessity spurs him on, for I have never heard of any man of means choosing the life of the prospector. The "average prospector" is charged with being a slacker. How cruel to say so, when he often has to rely on his gun for most of his tucker, and do his prospecting in addition. And he can only be a "romancer" of his successes when he gets to civilization on a "flare up"; and who would begrudge him boasting of his triumphs after perhaps months of privation and hardship, seeing he does so much for humanity? This "well-known consulting engineer" says that the "average prospector" suffers from "country weaknesses": probably this gentleman recollects some favourites whom he selected as being fit and proper persons to be his prospectors, but who were not fit to wash clothes, to say nothing of a pan of dirt. And so this gentleman throws mud indiscriminately at prospectors, just because the men he employed for that important duty did not fill the bill—were not prospectors. The consulting engineer has no doubt ere this discovered that "anyone" won't do as a prospector. This consulting engineer states that "the prospecting in this country is liable to languish." To this I reply that if most consulting engineers had greater experience of surface indications when shown them, they could form a more correct opinion of valuable occurrences, instead of belittling these worthy men whose discoveries keep them in their billets; albeit there may be boozers and slackers among them, which is a failing in all walks of life—consulting engineers included. Like a fiddler or an artist, a true prospector is born and not made; he must have a sixth sense, so to say. He must have that subtle instinct to *know* where he will find gold, or whatever minerals may be in the country he is exploring. That sense I cannot define; it is born in him, as "dowsing" is in a water diviner. It is a wonderful gift which cannot be imparted to another. And so the consulting engineer stands at a disadvantage with the prospector, in that he must rely solely on the latter's efforts to acquire his absurdly highly paid job, because he is not a prospector and can never be one. To continue: This gentleman, the consulting engineer, from his remarks seems to think that "the average prospector" is useless as a finder of pay ore, for he says that "prospecting is a scientific undertaking that requires initiative, resource, and perseverance." I have yet to learn that the Royal School of Mines has produced any man who combines "initiative, resource, and perseverance" enough to make the lucky, hardy prospector. The Royal School of Mines turns out scientific theorists by the thousand; but has it yet turned out a successful prospector inured to the hardships of such a life, with his inborn knowledge, robust health, and rugged strength? I have not heard of one even. Does that prosperous gentleman, the consulting engineer, who fires his bitter and insulting remarks from his comfortable office chair, know that the Australian Governments have such confidence in the prospector, that they fit out expeditions to find greater mining fields than they now have, and the financial assistance given to prospectors and small mines amounts to scores of thousands of pounds sterling annually. Sir, this consulting engineer is *not* a prospector evidently, nor could he ever be one. I may tell him that the prospector's art is far older than his science of mining engineering; and that the earlier trade does not of necessity require the help of the later one; for he would be a poor prospector indeed who could not run his mine without the theories of the gentleman from the Royal School of Mines. Who found the Rand banket—was it a farmer or a consulting engineer? Who discovered the Heidelberg series—was it a prospector or a geologist? Who struck the gold in the great Sheba mine and the other successful properties in De Kaap gold fields and other mining centres in Africa? Were they Royal School of Mines men or hard bitten prospectors, who fossicked their way "humping billy," and living a life which would be impossible to this consulting engineer, and all for the love of the trade. Cheerfully facing discomforts which most consulting engineers could not endure, and so giving work to vast future populations: thus these hardy pioneers paved the way for the hundred and one fat and totally unnecessary billets which hang on the mining industry. These remarks apply to all countries which produce minerals. The average consulting engineer who owes his position primarily to the prospector, generally receives a princely salary; the average prospector is grudgingly given about half as much as he could earn as a miner. The consulting engineer could not be in a hurry to make his report, it would be undignified; but let the poor prospector slack off—or, oh! horror, be seen the worse for liquor—and it would be, "Put in your time!"—Yours, etc.,

FOSSICKER.

Barberton, De Kaap Gold Fields,
March 30th, 1914.

OIL SHALE MINING.—I.*

A Detailed Discussion of an Industry of Great Potentiality in South Africa from the Investor's Point of View.

[By J. F. KELLOCK BROWN.]

THE term "oil shale industry" is applied to the production by destructive distillation from shales of (1) the crude products—crude oil, ammonia water and gas, and (2) the refined and manufactured products—naphtha, intermediate oil, lubricating oil, burning oil, paraffin wax, candles, still coke, still grease, and sulphate of ammonia. Therefore oil shale mining includes not only mining problems, but also the operation of a chemical plant, and the disposal of a variety of products in the face of a fluctuating, complicated and generally severely competitive market. The subject is not being treated herein from the point of view of the technical expert on works management, nor yet from that of the chemist, but rather the attempt is made to discuss "oil shale mining" as the investor ought to see and understand it, since he is the man who provides the funds and takes the risk, and his outlook should synchronise with that of any engineer engaged in investigations on behalf of financial interests. On this account such figures as are given are general, applicable in some cases to one producing centre; in others governed by a different set of circumstances; and in all cases the object of reasonable revision before comparison with any particular conditions.

GEOLOGY.

The original home of oil shale mining was in Scotland, but the glamour of phenomenal profits led to exploration in other countries, and shalefields have been found in Russia, France, Spain, New South Wales, Transvaal, Natal, Eastern Canada, Newfoundland and Eastern United States, and doubtless exist in many another land, where there is to date no inducement to undertake search and investigation. Up to the present all the discoveries made have been limited to approximately one geological horizon, viz., Lower Carboniferous and Upper Devonian. Apparently during that period of geological time, the conditions—mainly a predominance of plant and fish remains occurring in a quiet and undisturbed period of rock formation—were favourable to the deposition of the rock bed then or afterwards converted into oil shales. Of the deposits in the countries enumerated, all occur in the Lower Carboniferous, with the exception of a number of areas in Eastern Canada reported as belonging to Upper Devonian. Associated with most of the deposits are coal seams of variable quality. In the Transvaal, Natal, and New South Wales, good coals are found intermixed with the shales, but in the majority of the other deposits only thin and unworkable coals are exposed. This would seem to show the shale beds, in some cases, as lying above or below, generally below, what may be termed the normal Coal Measure position. There is considerable distinction in appearance between the shales of these various deposits. Those of the Lothians are, generally speaking, tough bronze leather looking rocks, cleavage planes not well developed in the smaller pieces, and capable, if good, of being cut with a knife into curly shavings—a rough indication of quality. The South Africans, partly the Australian, and partly the Canadian shales, are black gritty rocks, finely laminated and showing an almost perfect cleavage. When tried with a knife, they scrape to a gritty dust, or a thin flat plate cleaves off that will light at a candle flame giving an odour of burning oil. In the Scottish shales the streak is brown, sometimes grey, and they have a somewhat soapy feel. Small blocks can readily be cut and carved into ornaments. With other shales the streak is black or grey, and they cannot be cut or carved, owing to their cleavage and general brittleness. There has been as yet no complete nor comparative study of the different geological conditions in the various shale deposits, so there can be no explanation as yet as to the cause of these and sundry other points of variance. In the Scottish field the oil bearing strata exist, as a whole, in a highly disturbed and broken region, and the same conditions apply to the majority of the Eastern Canadian areas, but the Australian and Transvaal systems are regularly and quietly bedded, and in the latter case, particularly, are practically horizontal for miles. Apparently disturbed conditions, or unbroken stratification, have no essential effect on the yield, nor on the thickness of the beds, but the yield varies greatly from various workings, just as the quality of coal seam alters and may range from 20 gallons to the ton—under certain conditions, the lowest workable yield—to as high as 130 gallons to the ton. On the whole high yields are usually confined to local areas in most shalefields by comparison with the immense quantities of oil bearing rock of lower value. Such rich shales have mostly been given special names, such as Torbanite in Scotland, Albertite in New Brunswick; while the first name has also been transported to New South Wales. The contention that the Scottish field has shown decreased yield with depth with increased sulphate of ammonia, does not appear to be particularly well founded, the difference being slight, irregular and apparently local, and it does not follow that other shalefields will show the same phenomena. With oil shale seams horizontally bedded, a gradation from oil shales to bituminous shales may occur, without, in some cases, any change in appearance. A bituminous shale is, however, entitled to the term oil shale provided it yields sufficient oil to be commercially workable. While shales are usually continuous in quality over a large area, yet local conditions may cause serious loss of quality or quantity. The occurrence of oil itself is a common phenomenon of oil shale fields, but never, however, on a commercial scale. Many attempts have been made to prove flowing wells in connection with shale deposits but such a supposition is hardly reasonable since it presupposes such exceedingly extensive natural distillation as to destroy all the shale deposits themselves. Distillation round local centres of intrusive rock is frequent, and sometimes gives rise to gas and oil wells of limited extent. It is a fair supposition to state that any shalefield which furnishes much evidence of quantities of natural oil or gas is approaching worthlessness as a commercial shale deposit; its yield will be patchy and the value uncertain. There is undoubtedly some connection not as yet understood by geologists and chemists between oilfields of the well type and those of the shale type, and although this appears to be simply a scientific problem the solution of which will provide no data of practical value, it is equally possible to imagine it as a considerable help towards that desirable end—the production of an artificial oil in the laboratory.

EXPLORATION.

The exploration of any shale area is prospecting work which demands care and accuracy for two reasons, (a) the variability of the yield of oil, and (b) the large capital outlay necessary. Variability of yield may be due to either internal or external causes. Internal as in the case of coal seams, but generally showing a greater difference over a much shorter distance. Externally through intrusive sheets or dykes of plutonic rock, actually in, replacing, or close to, the shale beds, producing a natural distillation which in turn gives rise to the evolution of small gas or oil blows—features of some shalefields. Where such dykes of igneous rock cut across the regular stratification, some idea is readily obtained from a study of the surface geology of the prospects of the field as a valuable shale producer, but where the intrusive mass takes the form of horizontal sheets, parallel at least with the bedding planes, this process of natural distillation and consequent loss in quantity may occur over large areas without showing any indication thereof. There are unfortunately practically no field tests which can be stated as typical of good oil shales, the few known being the result of observation in the Scottish shalefields, typical of those beds and therefore only applicable to particular areas, being by no means reliable if utilised as standard tests in any newly discovered district. The only trustworthy test is actual distillation. This is carried out in many degrees of elaborateness from the good laboratory tube down to the use of a pipeclay pipe luted with clay and heated in a camp fire. The laboratory tube gives good results in crude oil, but the quantity of sulphate of ammonia produced is only about half that obtained in actual practice. Depending on whether the shalefields are approximately horizontal or nearly vertical, exploration is conducted in the first instance by boring, or shaft sinking, and drifting in the seam. Where boring is resorted to a large-sized core drill can be used to advantage, since the object of drilling is not only to show that the shale bed is in position, but also to allow of an accurate test of its value by the recovery of a sufficiently large core. A sample of 4 to 5 lbs. ought to be obtained, and the more sections of the seam got from each core the better will be the average results attained. Drill holes to be of any value should be carried down at frequent intervals—say at the corners of 1,000 ft. squares—and careful records made, not only of the depth and thickness, but also of the position and character of the various beds of strata passed through. Shaft sinking and drifting is the heavier work, but is in most cases necessary in the end, and where development can afterwards be transformed into tonnage in sight, it is possibly the more economical method. It should be looked upon as most advisable when exploring a shale area to extract 150 to 300 tons for actual treatment in some existing works, and this quantity can only be obtained from shafts or drifts. Development in advance of works requirements is necessary to some extent with a large plant being supplied by one mine, but a more usual practice is to erect a large and central plant and obtain the shale supplies from a number of mines. Owing to the large capital requirements, there is a certain minimum area to locate which will be placed against the life of the plant and its capital redemption. Oil-shale production being made of a chemical industry than a mining proposition, the plants are continuously running and are proportionately more economical on a large and continuously working scale. Just how large an appropriation of funds is required to thoroughly prove a shalefield is a matter that depends on many circumstances, the principal of these being (a) the position of the property, (b) the country and climate, (c) the area held, together with sundry other factors that may develop as investigation proceeds. (a) The position of the property affects expenditure in regard to its relationship to surrounding developed mines. If situated in the centre of a very well known field, and of a small area, development can be comparatively less than in an outside and previously untouched property or district. (b) Depending on whether exploration is undertaken in a well developed or entirely unexplored country as regards shale area, the necessary expenditure will increase the less there is known of the country's resources. Climate is mainly a matter of wages cost, the heaviest item in development operations. As a rough statement wages are low in the hot climates, with the reverse the case in the cold. This is, of course, no rule, and obvious exceptions occur—for example, Manchuria. (c) Expenditure will, of course, vary proportionately to the area to be explored. Undoubtedly the best method of financing the early stages of an oil shale venture, particularly in a fresh country, is by the formation of a preliminary company expressly to carry out this exploration. This course has its own objections, the chief being that such a company, taking a heavy risk, is entitled to a larger return, and in this way frequently succeeds in causing the over capitalisation of the final company. Where such preliminary companies have been formed in the past their capital has usually not been less than £10,000.

(*To be continued.*)

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*Read before the Western Branch of the Scottish Federated Institute of Mining Students.

Rhodesian Section.

LATEST MINING NEWS.

The Cam and Motor Plant—Broken Hill to be Revived—Minerals in the Rhodesia Museum—The Shamva—Boring Operations at the Giant—Rhodesia, Ltd.—The Buck's Reef.

ACCORDING to reports from Rhodesia, the initial running of the Cam and Motor plant has not been attended without trouble. It is understood that the works were shut down temporarily for about ten days, so as to admit of sundry alterations being made. Some of the furnaces had to be re-built, and about half-a-dozen bricklayers were at work night and day shifts. It is stated that the bricks were laid in cement instead of fireclay, and the cement, unable to resist the great heat of the furnaces, naturally crumbled.

* * * *

A correspondent of the *Rhodesian Mining Review* writes: "It is good hearing that a definite decision has been arrived at to re-open the mine at Broken Hill during June next. The new plant for treating the ore is, I am informed, on the point of being shipped from England. When in full working order it will afford employment for about fifteen Europeans, and, should it prove successful, will involve the installation of a considerably larger plant, which should mean a very substantial increase in the white staff. It is to be sincerely hoped that this renewed activity on the part of the company may be rewarded with success, as the influx of additional population thereby involved would make a very substantial difference to the material prosperity, not only of Broken Hill, but indirectly also to the whole of this portion of the Territory."

* * * *

The collection of gold ores in the Rhodesia Museum has been re-arranged in accordance with modern principles of the classification of ores. The majority of the ores fall into one of two groups, either gold quartz veins, or impregnation and replacement deposits in the schists. Each of these groups is sub-divided according to the chief sulphide present, *e.g.*, pyritic gold quartz veins, arsenical gold quartz veins, antimonial gold quartz veins, etc. Specimens of the oxidised and unoxidised ore, and of the wall rocks of any mine unrepresented in the collection will be welcomed, as it is desired to make the collection of Rhodesian ores as representative as possible. They may be forwarded rail free, if addressed as specimens to the Rhodesian Museum. A collection of rocks, showing the geological sequence in the Wankie Coalfield and illustrating the recently published bulletin on the geology of that area, has been placed on exhibition temporarily by the Geological Survey.

* * * *

The following cable was sent in mail week by the local to the London office of Shamva Mines, Ltd.:—"Trial run continues to be satisfactory; half the mill and five tube mills are working; remainder gradually coming into commission; residue assay indicates entirely satisfactory extraction."

* * * *

From time to time rumours from Gadzema reach us with regard to the progress of the boring operations on the Giant South, which are said to have been more successful latterly. In this connection the following copy of a cablegram, published in mail week, is of interest:—Giant South No. 5 borehole from 86 ft. to 96 ft. (only 15 ins. core recovered), assays 17·1 dwts. From 96 ft. to 107 ft. assays show traces.

* * * *

Rhodesia, Ltd.—Cablegram: During January 100 ft. of development were executed at the Sabiwa mine. Kopje section 4th level drive south has been extended 31 ft. during the past month, making a total of 309 ft. Have discontinued driving temporarily. 4th level drive south.—Winze No. 1 to 5th level, down 67 ft. below No. 4 level. Still in dyke. 3rd level drive south.—Winze No. 2 to 4th level sunk 13 ft. during past month: total, 62 ft. High grade ore maintains. 2nd level, drive south.—Winze No. 2 to 3rd level, sunk 12 ft. during past month: total, 75 ft. Ore still continues good value. Mine has been inspected by geologist. He is satisfied dolerite still intrusive, and that reef will be picked up without difficulty below. Evidence insufficient to estimate what is the thickness. No. 4 shaft sinking re-started to prove the reef under intrusion.

* * * *

In our last issue we stated that Mr. Black was tributing the Buck's Reef mine in Southern Rhodesia. This is not quite correct. Mr. Black, it is true, is preparing to take over the mine on a tributing basis, but until a meeting to be held in Johannesburg about the middle of next month, and which is to confirm the arrangement between the local Board and Mr. Black is over, it is unlikely that operations will be resumed at the Buck's Reef mine, which, by the way, was floated about four years ago and in which Mr. H. J. King, it will be remembered, was the leading figure.

* * * *

A table, showing the value of the monthly and annual gold outputs, together with the value of the other minerals recovered, is appended:—

Month.	1912.	1913.	1914.
January	£214,918	£220,776	£249,031
February	209,744	208,744	259,722
March	215,102	257,797	
April	221,476	241,098	
May	234,408	243,452	
June	226,867	240,303	
July	240,514	249,302	
August	239,077	250,576	
September	230,573	250,429	
October	230,072	247,068	
November	225,957	239,036	
December	218,661	254,687	
Total Gold	£2,707,369	£2,903,268	£508,753
Other Minerals . .	259,578	253,674	57,833
Total value	£2,966,947	£3,156,912	£566,586

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RHODESIA'S NEW PRODUCERS.

Initial Returns in the February Output List—Shamva, Cam and Motor and Antelope Companies' Contributions.

THE gold output of Southern Rhodesia for the month of February, as was generally anticipated, constitutes a record over the declaration of any preceding month by a substantial margin. This is due, of course, to the inclusion of the outputs of two or three concerns which have been steadily developing and equipping for some months past, and which now announce details of their initial outputs. The output from gold alone, despite the fact that February was a short month, was £259,722, as against £249,031 in January and £254,687 in December—the previous record. For the first two months of the current year Southern Rhodesia's gold output has been worth £508,743, as compared with £429,520 for the corresponding period of last year. Three new companies of note have substantially augmented the return. The Shamva, with 32 Nissen stamps and 5 tube mills at work, crushed 18,078 and cyanided 6,713 tons for a yield from milling of 1,134 ozs., valued at £4,809, and from sands 151 ozs., of a value of £642. The total output of this company is thus £5,451 out of a total of £9,597 for the whole of the Salisbury district. The February return is the outcome of trial runs rather than of normal crushing operations and is not indicative of the productive capabilities of the company. This is explained in an official circular, which states:—"Trial runs in February crushed 18,078 tons; average assay value feed 4.020 dwts., average assay value residue sands ·330 dwts. per ton, average assay value residue slimes ·220 dwts. per ton. Gold recovered, 1,285 ozs. fine estimated absorption by plant so far in operation, about 58 per cent. of the gold contents. Trial runs being continued this month." The Cam and Motor Company's plant is described as "Roasting," and the tons treated are given as 10,693, the yield therefrom being 3,737 fine ozs., of a value of £15,814. In addition there was a yield from slags of 189 ozs. in value £800. Here, too, the productive operations were of a purely abnormal nature, and much better returns are to be expected in the near future. In the Matabeleland Province the Antelope announces a return of £3,683 from mill and £2,234 from sands, the plant in operation consisting of ten pans. A very small profit was earned, but this was due to delays in connection with the plant and the initial difficulties inseparable from bringing a mine to the productive stage. Although the Kimberley (Mashonaland) G.M. Company has been crushing for some little time, it is one of the newer producers of the country and its returns should be of interest. In February this company had 6 stamps and 2 tube mills working and crushed 3,400 tons for a total yield of £4,880, made up as follows:—From mill, £3,025; sands, £1,241; slimes, £614. In the near future other new producers will add to the output, which before very long should be at the rate of over a third of a million per month.

MINING PROGRESS IN THE BELGIAN CONGO.

Labour Troubles—Introduction of Chinese Labour Contemplated—Copper and Diamond Output.

MESSRS. Sydney H. Ball and Millard K. Shaler contribute to a recent issue of the *Mining and Scientific Press*, of San Francisco, an article on "Mining in the Belgian Congo in 1913," which discusses several interesting aspects of activity in the Katanga and other portions of this great Central African State. The article points out that the gross mineral production in 1913 was valued at about three million dollars—more than double that of 1912. "The increase was due to a larger production of copper in the Katanga region, and a fair increase in the gold output. The year was further marked as the first in which the colony produced diamonds on a commercial scale. The past year has seen, as forecasted as probable in this review last year, a start toward a lowering of the Draconian mining taxes. These taxes must be further reduced, however, and in other ways mining offered governmental support, if the industry is to flourish in the colony. It is hoped that the acute labour situation in the Katanga, in particular, will be relieved." Messrs. Ball and Shaler then go on to deal with the labour question, which is a very big problem in the Belgian Congo. The authors suggest the introduction of Chinese labour to work the copper belts, and in this respect they write:—

> If African sources fail, there appears to be but one way in which the Katanga can rank as the copper producing region its resources apparently warrant—namely, by the importation of Chinese labour. The Belgians are by no means novices in handling such labour, for it will be remembered that some of the more important Chinese railways have been built by Belgian engineers with Belgian capital. Further, in 1893, some Chinese labour was used in the construction of the Lower Congo railroad. A year ago an attempt was made to import Chinese to work the tin deposits of Kasonso (Katanga), but unexpected obstacles rendered this impracticable. What are the difficulties in obtaining for the Katanga these patient, industrious, Asiatic labourers? It will certainly be expensive, for the importation and repatriation of each coolie in South Africa costs about 85 dollars; the corresponding figure for the Lower Congo railroad labourers was 160 dollars. Each Chinaman travelling by way of Beira, the most practical route to the Katanga at present, would presumably cost the companies 100 dollars. The initial outlay, while great, would perhaps in the long run be found to be well expended. Possibly the Rhodesian Government would not permit these labourers to pass through her borders. In South Africa there is a strong sentiment of "South Africa for the whites," and public opinion would be strong against the introduction of Asiatics, even into the Katanga. This difficulty could, however, probably be surmounted if the Belgian Colonial Government would assure the British authorities that the number to be imported was comparatively small, and that adequate measures would be taken to prevent the coolies filtering across the frontier into Rhodesia.

Reference is made to general prospecting activity, and it is stated that during 1913 the Belgian—American Company, Société Internationale Forestière et Minière du Congo was given for 99 years the right to exploit its discoveries south of the fifth parallel south. The claims, chiefly for diamonds, gold, iron and asphalt cover about 4,400 square miles.

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THE WANKIE COLLIERY.

Rhodesia's Most Important Coal Field—Method of Working Described.

In our last issue we dealt at some length with the interesting paper by Mr. H. B. Maufe, Director of the Geological Survey of Southern Rhodesia, on the coal resources of that country, contained in Bulletin No. 4 of that Institution, and we now propose to deal briefly with two other instructive contributions to that publication—the Geology of the North-Western part of the Wankie Coal Field, by B. Lightfoot (Geologist), and the Wankie Colliery and Method of Working the Coal, by A. R. Thomson (General Manager, Wankie Colliery). Mr. Lightfoot, in opening his paper, recalls the fact that the field was originally discovered by A. Giese. He then gives a table showing the succession of rocks met with in the area surveyed, the beds being arranged in descending order:—

Karroo System.

		Thickness in feet.
Batoka Basalts.	Amygdaloidal lavas with thin sediments between the flows.	Minimum 1,000
Gap.	Represented by Deka Fault.	
Forest Sandstones.	Fine-grained, false-bedded red sandstones.	Top not seen. 100
Escarpment Grits.	Coarse grits and conglomerates.	300
Madumabisa Shales.	Gray and green shales with abundant limestone nodules.	Variable. 750
Upper Wankie Sandstones.	Coarse-grained white sandstone with thin coals and bands of shale.	100-200
The Fireclay.	Generally silicified. Not represented to N.E.	50-80
Black Shale and Coal.	Interstratified coal and shale.	
Lower Wankie Sandstones.	Coarse and fine sandstones containing fragments of granite, and with layers of shale and coal.	
	Unconformity.	
Norite.	Intrusive into gneiss.	
Gneiss (Archæan.)	Chiefly granite gneisses.	

Whilst Mr. Lightfoot's paper is in every way admirable, it scarcely possesses the general interest of Mr. Thomson's contribution, and we will therefore pass on to that. Mr. Thomson, *inter alia*, remarks that the Wankie Colliery Company has the right to mine coal over an enormous area approximating 400 square miles, and has surface rights to 20 square miles. There are three seams of coal of workable thickness on the company's holding. The bottom coal is the seam now being worked, and this seam extends throughout the valley lying to the north of the colliery and is estimated to contain 480,000,000 tons of coal. Within recent times no exploratory work has been done on the coal measures lying within the Wankie Company's area. A geological traverse was made over this country about ten years ago, and prospecting shafts were sunk at either end of the traverse. The coal to the south of the Colliery behind the granite interruption is 16 ft. thick. At the boundary of the Wankie concession, 16 miles away, the coal is 4 ft. thick, and no faults of any importance exist in the area traversed. The coal is reached by means of an incline shaft 600 ft. long, with an average grade of 1 in 7. The coal dips towards the north, the average inclination being 1½ ins. to the yard. In working the coal from the levels the following method is adopted:—

Stentons are driven through the barrier pillar separating the intake and return level at points 66 feet apart. Opposite these stentons on the inside, stalls are opened out in the solid coal, and theoretically 33 feet of coal is mined and 33 feet of coal left standing as a supporting pillar, these pillars in turn being pierced by stentons every 66 feet. In practice this method is slightly modified to suit circumstances. Where the roof is strong the stall may be carried wider than 33 feet. Where the roof is shaky the width of stall may be diminished. Work is stopped 30 feet from the level to which the stalls are driven to create a barrier pillar. In looking at the plan it will be seen that in some places the barrier pillars have been pierced for convenience in working. Where this has been done these gate-ways are built up with stone or brickwork on their period of service being completed. The average thickness of coal throughout the mine is 8 feet 6 inches. The thinnest coal is in the eastern section, where the seam is worked towards the granite outcrop. In the western section, one mile distant, the coal is 12 feet 6 inches thick. Coal-cutting machinery has been experimented with, but, owing to a variety of causes, these experiments have not proved as successful as could be wished, and the most satisfactory results are got by using the Elliott hand boring machine with twist drills, a native being able to drill eight holes to a depth of 5 feet for his shift's task with these machines. 5 feet 6 inches of coal is extracted in the first operation, care being taken to keep one part of the face advanced to form a "cut" to which the other holes "break." The top coal may be left up indefinitely under certain conditions, when it forms a good reserve, in that it can be dropped expeditiously and cheaply should there be a rush of coal orders. This is usually accomplished by hand labour. Another method of dropping top coal is where the drilling machine is turned back over, and the top coal drilled and blasted down a short distance behind the first face.

The haulage operating the main shaft as far as the "Bell Station," at the bottom of the incline shaft, is ordinary main rope haulage and is capable of dealing with 1,500 tons of coal per shift of 10 hours. It is actuated by a compound steam engine. Two haulages are usually in commission at one time, but coal to furnish an output of 15,000 tons sales has been handled in 25 shifts on one haulage only. A parallel shaft to the present main shaft, operated by endless haulage, is now in course of construction. Ventilation is accomplished by means of a 10 ft. Schiele exhaust fan, capable of exhausting 350,000 cubic ft. of air per minute.

The screening plant consists of three shaking screens with tipplers, shaking shoots, under-size conveyor belts, elevators, picking tables, and side refuse conveyors, and is capable of dealing with 2,000 tons of coal per 10-hour shift. Two of the screens are steam driven, and the third is operated electrically. The screening plates are fitted with 1¼ inch round holes. As the coal leaves the tippler it is conveyed by the shaking shoot, which spreads out the coal on the shaking screen. All coal less than 1¼ inch size passes through the holes in the screen on to a conveyor belt underneath. The over-size drops on to the travelling picking tables. These tables are 60 feet long and travel parallel with the railway line, the coal dropping into the truck at the end away from the screens. Natives are stationed alongside these tables and pick off shale or brassy coal, and place it on side conveyors, which convey it to a bin for transference to the rubbish heap. The undersized coal is transferred by conveyors to the washery, where it is classified into four sizes and washed. The washery is capable of dealing with 20 tons of coal an hour, and consists of four washing jigs, with elevators, tanks, etc. The machine is driven by a 50 h.p. motor. The coal for washing is classified from 0 to ¼ inch, ¼ inch to ½ inch, ½ inch to ¾ inch, ¾ inch to 1¼ inch. The two finer sizes are treated in felspar jigs, *i.e.*, a layer of felspar is introduced in the washing blocks. The holes in the bottom of the boxes are larger than the size of coal being treated. The size of the felspar pieces is larger than the holes in the bottom of the box; consequently when coal is introduced the jigging motion causes the coal, dirt and the felspar to arrange themselves according to their relative specific gravity. The coal being lightest keeps to the top, felspar being lighter than the dirt takes the middle position, and the dirt being heaviest drops to the bottom, but, as the holes in the bottom of the box are larger than the dirt, the dirt drops through into the tank, from which it is cleared out by elevators. In the larger sizes of coal a separation is effected without the use of felspar.

The smaller sizes of coal are used up in coke making. A battery of thirty 12 ft. beehive coke ovens fitted with bottom flues is in commission at the colliery. This plant manufactures 1,800 tons of coke per month.

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of February, 1914, is as follows:—Reef: Mill: Gold won (fine gold), 315 ozs. 13 dwts. 0 grs.; tons crushed, 976; value £1,325 13s. 11d. Concentrates (estimated): Gold (fine gold), 7 ozs. 17 dwts. 0 grs.; tons, 3·3; value, £33 7s. 3d. Cyanide: Gold recovered (fine gold), 7 ozs. 1 dwt. 10 grs.; tons treated, 36; value, £29 13s. 8d.; Alluvial: Gold recovered (fine gold), 831 ozs. 16 dwts. 14 grs.; cubic metres treated, 60,000; value, £3,493 12s. 9d.; also won from ground treated in construction basin in January and beginning of February, 82 ozs. 2 dwts. 14 grs.; value £344 18s. 4d.

RHODESIAN MINERAL OUTPUT.

Details for February—A Record Yield of Gold and Minerals Generally.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of February, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Abercorn (W. J. Lane)	2	278	116·79	490
Do. (sands)	—	168	26·73	112
Agincourt (H. L. Maidwell)	5 1P	84	59·87	251
Antelope G.M. (Rhod.), Ltd.	10P 2BM	2,687	867·92	3.683
Do. (sands)	—	2.687	531·99	2.234
Atlas (Est. R. Barkley, decd.)	10	667	68·10	286
Do. (sands)	—	510	35·14	148
Bangali (Arbery & Hicks)	—	—	9·91	42
Bembesi (Ding-Dong Syndicate)	2	19	11·71	49
Bilbah (M. E. Weale), sands	—	126	8·85	37
Big Ben (W. E. Hunt)	4	214	80·10	336
Do. (sands)	—	132	37·22	156
Blanket (Forbes Rhod. Synd., Ltd.)	15	885	160·92	676
Bobs (F. W. Spencer)	5	172	36·69	154
Bunthorne (J. O. Jansson)	5	100	18·89	79
Burton (S. H. Burns), sands	—	250	13·55	57
Bushtick Mines, Ltd.	23 3T	5.624	149·25	627
Do. (sands)	—	3.023	594·59	2,497
Do. (slimes)	—	2.525	286·42	1,203
"C." (D. and C. Syndicate)	10 1C	1,094	63·07	265
Do. (sands)	—	944	95·97	403
Do. (slimes)	—	150	43·15	181
Carry (S. and G. Syndicate)	1 H	67	54·65	229
Do. (sands)	—	220	145·12	609
Champion II. (R. Aserman)	5	524	59·18	249
Do. (sands)	-	289	21·07	88
Claremont (B. L. Whyte)	7	800	114·02	479
Concord (W. Reid)	5	500	58·03	244
Colleen Bawn (Colleen Bawn Synd., Ltd.)	6 2P	697	29·73	125
Do. (sands)	—	347	18·05	76
Do. (slimes)	—	514	94·52	397
Cottage (Cranleigh Syndicate)	2	70	27·81	117
Do. (sands)	—	52	24·51	103
Criterion Gold Mines, Ltd.	10	1.182	413·04	1,735
Do. (sands)	—	798	67·99	286
Cumberland (H. W. Bearcroft)	5	110	69·17	290
Eagle A. (Macdonald & Co.)	10	784	193·64	813
Elly (Philip & Schwirner)	1H	55	9·00	38
Elumba A. (Cooper & Bosomworth)	5	625	192·40	808
Do. (sands)	—	300	98·74	415
Farvic (H. S. Henderson)	5	396	178·45	749
Do. (sands)	—	308	28·22	119
Fred (Transvaal & Rhod. Est., Ltd.)	10 2P	1.450	640·95	2.692
Do. (sands)	—	1,450	267·06	1.122
Godwin B. (Barrett & Stacey)	5	130	150·89	634
Golden Butterfly (Wheeler, Davis & Rintoul)	5 1P	423	184·92	777
Holdfast (C. H. Rule)	(5)	120	7·77	33
Imani (E. Rochfort)	2	180	140·19	589
Intabanenda (Est. B. Smallie, decd)	5	205	31·87	134
Do. (sands)	—	156	23·76	100
Jem (A. Rivington)	(5)	53	18·34	77
Do. (pannings)	—	—	·61	2
Jumpers (J. P. McCay)	5	400	271·87	1.142
Do. (sands)	—	330	97·66	410
Kameel (New Rhod. M., Ltd., and A. M. Rhodes)	—	—	97·34	409
Do. (Yellow Jacket Syndicate)	5	391	151·54	636
L. (J. A. Warwick)	5	331	57·77	243
Do. (sands)	—	272	48·84	205
Laxey (Manx Syndicate)	4	200	54·38	228
Lone Hand (Armstrong, Furber & Alexander)	5	480	146·65	616
Do. (sands)	—	288	35·35	148
Lonely Reef G.M. Co., Ltd.	20 3T	5.910	1.541·56	6.475
Do. (slimes)	—	5.910	2.940·66	12 351
Long John & Lady Lina (Susanna Mines, Ltd., & B.E. Co., Ltd.)	8	1.234	226·19	950
Do. (sands)	—	643	121·87	512
Do. (slimes)		267	38·90	163
Mary and Alice (R. Dodman)	3	64	28·86	121
Master Cecil (Master Cecil Synd.)	3	16	5·48	23
Matabele Queen's Co., Ltd.	10	1.700	387·26	1.626
Do. (sands)	—	1,700	415·32	1.744
Do. (slimes)	—	580	65·83	276
M'Takati (R. Aserman)	2	60	12·81	54
Nathan (N. Edwards), pannings	—	—	10·71	45
Ndaba (M. Westerberg)	2	25	9·04	38
Nelly (F. D. Roscoe)	3H	547	288·09	1.210
Do. (sands)	—	460	51·53	216
New Eclipse (J. R. Stewart)	5	940	138·05	580
Do. (sands)	—	320	30·67	129
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	2.193	792·14	3,327
Do. (sands)	—	1.218	167·85	705
Do. (slags)	—	—	12·23	50
Peach A. (C. Salomon)	5	130	219·45	922
Penzance (Penzance Trib. Synd.)	2	120	30·01	126
Do. (sands)	—	78	32·22	135
Planet (Huntley & Triggs)	5	370	84·34	354
Polka (W. H. Robinson)	2	84	11·25	47
Do. (sands)	—	180	12·11	51
Princess 2 (C. A. Abbott)	2	249	19·05	80
Riverside (R. Martindale)	2	80	7·73	32
Do. (sands)	—	42	4·04	17
Roan (J. Robinson)	2	220	34·04	143
Rous 1 (A. G. Hadingham)	2	96	35·85	151
Sabi Extra (R. Bain)	10	250	114·92	483
Star (Star of Rhodesia, Ltd.)	5	160	101·64	427
Teutonic (Macdonald & Bonshor)	5	602	360·04	1,512
Trent (F. A. M. Syndicate)	1H	40	14·45	61
Tuff Nut (King's Syndicate)	5	540	207·32	871
Do. (sands)	—	350	26·82	113
Do. (slimes)	—	160	9·72	41
Umviga (Cumings & Berry)	3	195	78·22	329
Winifred (Exchange Syndicate)	1 I.R.	89	54·53	229
Do. (sands)		85	34·70	146
Worthless (Forward (R) G.M., Ltd.)	—	—	4·35	18
Bulawayo district total			16,432·78	69,015
Gwelo District—				
Alderman (Williams & Woodger)	3	225	148·27	623
Ardpatrick (C. Malcham)	3	350	103·14	433
Arizona No. 2 S. (L. R. Evans)	2	85	28·42	119
Bluegum (H. B. Christian)	1H	536	55·06	231
Do. (sands)		460	28·84	121
Cactus 1 (Renton & Gray)	5	430	66·61	280
Do. (sands)	—	410	63·60	267
Collingwood (Pini & Wearing)	1BM(4GR)	1.208	141·23	593
Csardas (Wolfshall Syndicate)	10	579	522·37	2.194
Do. (sands)	—	450	44·05	185
Do. (slimes)		129	13·41	56
Delegates (O. Hardy)	2	20	5·55	23
Eileen (M. L. Price)	5	400	47·75	201
Elysion (Holmes & Urquhart)	5	550	37·45	157
Fenella (J. Kinrade)	5	12	10·15	43
Gaika G.M. Co., Ltd.	5 1C	2,747	1,544·74	6,488
Do. (sands)	—	1,354	96·30	404
Do. (slimes)	—	1.600	103·04	433
Glen Rosa No. 1 (H. G. Mackintosh)	2	146	75·09	315
Globe and Phoenix G.M. Co., Ltd.	40 10P	5.752	7,248·83	30,445
Do. (concentrates)	—	264	612·54	2,573
Do. (slimes)	—	1,604	512·91	2,154
Gothic and Pagamesa (Mashonaland Agency, Ltd.)	15 2P	1.260	306·94	1.302
Do. (sands)	—	1.237	114·45	485
Do. (slimes)	—	450		
Invulnerable (W. H. Steele)	5	70	9·51	40
Kaka Main (L. Malcham)	5	367	66·00	277
Kings (P. S. Warden)	5	455	180·32	757
Loongana (A. Malcolm)	5	180	59·70	251
Moonie River (Yellow Jacket Synd.) (sands)	—	150	11·17	47
Moss (James & Morrisby)	2	757	445·55	1.872
Do. (sands)	—	864	70·31	295
Multum (W. Cock)	3	120	17·15	72
New Dunraven G.M., Ltd.	5	800	85·87	361
Do. (sands)	—	800	43·06	181
North Bonsor (Cornish Syndicate)	20	2,000	221·46	930
Do. (sands)	—	1.260	107·98	454
Paradox (Bolt & Franks)	5	120	30·76	129
Pompei (F. Brorson)		—	2·93	12
Redhill Dev. Synd., Ltd.	1C	2,300	103·90	436
Do. (sands)		1,283	49·39	208
Shamrock (Champion & Masters)	10	700	54·37	228
Snowed Up 1 S.E. (James & Morrisby)	5	582	186·47	783
Stranger (J. M. Havna)	2	185	49·77	209
Do. (sands)	—	160	47·57	200
Tebekwe (A. N. Tyrrell)	15	751	343·89	1,444
Do. B2735a (H. C. Baker)	10	230	34·24	144
Twin Nugget 1 (Bogwald & Camell)	2	73	29·37	123
Veracity (J. Fischer), slimes	—	380	21·38	90
Wanderer (Selukwe) G.M., Ltd.	4GR	11.549	1,466·48	6,159
Warner (Yellow Jack Synd.)	5	200	31·69	133
Welcome Back (H. C. Luxat)	2 1H	670	191·43	804
Do. (sands)	—	455	24·62	103
Gwelo district total			15,917·01	66,867
Matabeleland total			32,349·79 ozs.	
Value			£135,882	

MASHONALAND.

	No. of Stamps	Tons Treated.	Yield. ozs.	Value. £
Hartley District—				
Abracadabra (P. O. J. Fry)	1D	—	12·14	51
Acorn Gold Mines, Ltd.	5	466	71·37	300
Do. (sands)	—	240	35·10	147
Agnes (P. S. Triggs)	5	399	104·35	438
Do. (sands)	—	560	25·45	107
Alabama (Alabama Syndicate)	3	300	106·55	447
Baltimore & Virginia (P. A. Enke)	1Pn	220	41·74	175
Brilliant (Mabel's Luck Syndicate)	7 1P	1,037	378·77	1,591
Do. (sands)	—	368	52·95	222
Cam and Motor G.M. Co., Ltd.	Rstr	10,693	3.736·71	15.844
Do. (slags)	—	—	188·68	800
Cheshire Cat (Arnold & Windley)	5 1P	570	195·78	822
Do. (sands)	—	367	44·87	188
Do. (slimes)	—	201		
Concession and W. Extension (C. E. Simpson)	5 1C 2P	2.317	403·41	1,694
Do. (sands)	—	1.716	110·37	464
Dalny (Macdonald & Sale)	5	774	52·83	222
Do. (sands)	—	400	144·17	605
Do. (slimes)	—	364		
Dalny 1W. (Macdonald & Sale)	5	484	36·91	155
Do. (sands)	—	242	36·89	155
Dalny 1 N.E. (C. Tallon)	5	300	50·21	211
Do. (sands)	—	140	20·76	87
Dolly 1 (C. Tallon)	5	200	23·28	98
Eiffel Blue (Willoughby's)	10	943	488·27	2.051
Do. (sands)	—	615	54·19	227
Eileen Alannah Mining Co., Ltd.	10	1,834	1.067·75	4.485
Enny Ext. (Ellsmoor & Goodyer)	5	455	105·25	442
Do. (sands)	—	464	60·52	254
Giant Mines of Rhodesia, Ltd.	30 2T	10,556	1.841·43	7,811
Glasgow Mines, Ltd.	5	437	204·75	860
Do. (sands)	—	240	88·14	370
Glencairn No. 3 (Glenrosa)	4	160	270·11	1.134
Golden Valley (Anglo-Transvaal Rhodesia Trust, Ltd.)	10	1,138	768·81	3,229
Do. (sands)	—	605	150·92	634
Grand 2 (Sun Syndicate), sands	—	780	39·73	167
Hepworth No. 1 (L. Heilman)	2	130	51·87	218
Hero 2 (Storey & Steele)	1H	170	26·20	110
Inez (Harill & Smith)	10	800	203·79	856
Do. (sands)	—	500	59·21	249
Juno (H. R. Nicholl)	5	400	27·97	117
Do. (sands)	—	250	15·70	66
Kanyemba (Kanyemba Syndicate)	5	440	468·90	1,969
Do. (sands)	—	250	29·07	122
Mali (McAdams & Purves)	2	50	7·30	31
Midwinter (Midwinter Syndicate)	4	437	72·79	306
Do. (sands)	—	275	26·09	110
Moliere (H. Moser)	5	595	85·38	359
Monastery B. (Sacks & Jafschitz)	5	76	14·64	62
Orcus 17 (St. Kilda Syndicate)	3	18	20·88	88
Owl (A. Ralfe)	10	1.254	513·23	2,156
Do. (sands)	—	1,060	205·14	862
Do. (slimes)	—	40		
Pickstone Gold Mines, Ltd.	10 1C	3.418	663·68	2,787
Do. (sands)	—	1,558	188·47	792
Do. (slimes)	—	1.360		
Pioneer (Hartley Pioneer Synd.)	5	390	70·69	297
Pomposo (J. Knott)	5	360	157·85	663
Rosaline A. (J. F. Meade)	5	160	35·90	151
Seigneury (Arnold & Windley)	5	424	146·23	614
Do. (sands)	—	280	22·49	94
Shepherds (Phœnician (Rhod.) Co., Ltd.)	5 1T	1,020	231·03	970
Do. (sands)	—	1,020	157·48	661
Sid (Sebawko and District Mines, Ltd.)	5	460	151·28	635
Do. (sands)	—	600	55·17	232
Thistle-Etna G.M., Ltd.	1C	2,588	687·71	2,888
Do. (sands)	—	2 512	196·07	823
Do. (slimes)	—	596	47·24	198
Trinidad 1 (T. McDowell)	4	450	59·81	251
Do. (sands)	—	300	20·66	87
Try Me 2 (R. R. Aitken)	5	500	94·67	398
Do. (sands)	—	480	34·25	144
Washington (I. J. Minnaar)	5	412	330·54	1,388
Do. (sands)	—	300	30·32	127
Hartley district total			16,222·86	68,358
Lomagundi District.—				
Ayrshire (J. E. Parker), sluicing	—	962	84·56	355
Eldorado Banket G.M. Co., Ltd.	20 2C 8P	4,579	1.591·26	6,758
Do. (sands)	—	4,298	702·10	2,977
Linnett (A. L. R. Morkel)	2	868	103·83	436
Lone Hill (F. B. Platt)	2	49	7·61	32
Mediteraneo (Perhat & Baburizza)	2	105	36·90	155
Medway (Stone & Standen)	5	320	50·67	213
Lomagundi district total			2.576·93	10,926
Mazoe District.—				
Alligator (R. Athey)	1 D	7	5·27	22
Botha H. (Cunningham & Allison)	5	700	38·79	163
Do. (sands)	—	350	40·71	171
Disputo 1 (J. H. Hall), sands	—	490	76·69	322
Dunstablo (J. Strachan)	2	96	36·84	155
Glandore (Harries & Cooke)	2	270	104·55	439
Jumbo G.M. Co., Ltd.	30	3,000	535·20	2,275
Do. (sands)	—	1,960	304·53	1,294
Do. (slimes)	—	1,040	90·58	385
Kimberley (Mash.) G.M. Co., Ltd.	6 2T	3,400	708·46	3,025
Do. (sands)	—	1.350	294·07	1,241
Do. (slimes)	—	2,050	145·42	614
Last Kick (Dominion G.M., Ltd.)	5	120	44·18	185
Micky (Micky Syndicate)	2	245	89·70	377
Mitre 8 (Bishop's Syndicate)	1D	15	15·12	63
New Found 1 N (D. H. Curry)	—	—	5·14	22
Oceola G.M. Co., Ltd.	5	390	187·83	789
Do. (sands)	—	280	33·08	139
Puff Adder Syndicate	2	223	62·60	263
Ravine F. (H. O. Coker)	2	195	52·68	221
Venus (Giles & Southey)	2	233	146·94	617
Xmas 1 N.W. (D. Pearce)	2	215	62·29	262
Mazoe district total			3.080·67	13.044
Salisbury District.—				
Arcturus (L. Chiappini), sands	—	500	71·94	302
Banker (Dyason & Wells)	3	10	1·67	7
Briar (J. Seton Rogers), sands	—	420	15·24	64
Inyague 3 (Hodge & Von Hagan	2	134	39·75	167
Do. (M. Friend), sands	—	80	14·27	60
Joker (Manduza Syndicate)	150	2	85·27	358
Louise Grand (H. S. Plant)	1H	950	182·72	767
Do. (sands)	—	750	64·01	269
Mont d'Or (Claxton & Bussell)	2	90	41·08	172
Do. (sands)	—	300	14·43	61
New Brixton (J. H. Hall)	2	70	23·83	100
New Full Back G.M. Synd., Ltd.	2	253	68·70	289
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	363	202·36	850
Do. (sands)	—	380	77·22	324
Olympus C. (D. Peridis)	1H	285	84·65	356
Shamva Mines, Ltd.	32 5T	18.078	1,134·13	4.809
Do. (sands)	—	6.713	151·47	642
Salisbury district total			2.272·74	9.597
Umtali District.—				
Cairndhu (E. K. Evans), sands	—	310	29·33	123
Champion (J. Buchanan)	5	720	76·49	321
Do. (sands)	—	460	140·64	591
Do. (slimes)	—	260		
Comet 2 E. (S. W. Roberts)	1H	42	17·95	75
Kent (E. Evans)	5	550	357·40	1.501
Do. (sands)	—	600	68·07	286
King's Daughter D.B. (Umtali Waterfall Syndicate), slimes	—	1.132	126·55	532
Liverpool 38 (R. G. Snodgrass)	5	692	100·77	423
Do. (sands)	—	220	19·05	80
Micawber (G. W. Randall), pannings	—	—	4·12	17
Monte Carlo 3 E. (H. Pollack)	1H	250	35·21	148
Montezuma 2 (Montezuma G.M. Co., Ltd.)	5	200	38·85	151
Do. (sands)	—	199	9·48	40
Oriental S. (J. Martin), pannings	—	—	2·43	10
Pilgrim 2 E. (O. R. Cawood)	5	507	104·16	438
Quagga (Quagga Syndicate)	5	325	51·05	256
Do. (sands)	—	1,000	55·38	233
Rezende Mines, Ltd.	110	17,400	1.585·99	6,729
Do. (concentrates)	—	162	625·93	2,618
Do. (sands)	—	2,878	269·32	1,143
Do. (slimes)	—	1,036	80·18	340
Surrey (Keir & Rooke)	5	750	295·27	1.240
Umtali A. (Umtali Waterfall Synd.)	10	538	365·97	1.537
Do. (sands)	—	217	45·28	190
Do. (slimes)	—	163		
Umtali district total			4,514·87	19,022
Victoria District—				
Empress A. (S.A. Prospecting and Concession Syndicate, Ltd.)	5	840	254·28	608
Do. (sands)	—	513	84·75	356
Do. (slimes)	—	246		
Texas (G. Scott)	10	1,310	253·07	603
Do. (sands)	—	700	94·36	396
Victoria district total			686·45	2,883

Mashonaland total	29,354·53 ozs.
Value	£123,840
Total gold production	61,704·32 ozs.
Value	£259,722

OTHER MINERALS.

Silver, ozs.	10.701·26	£1,089
Lead, tons	20·16	349
Chrome iron, tons	5,979·68	13,347
Diamonds, carats	145·5	414
Coal, tons	25,746	8,803

Total value of mineral production, £283,724

This constitutes a record both in the gold output and in the total mineral production in one month.

C: Chilian Mill; T: Tube Mill; G.R.: Gates Roll; H: Huntington Mill; P: Grinding Pan; Pn: Pneumatic Mill; D: Dolly

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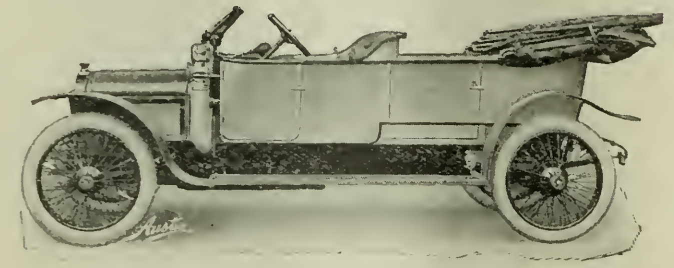
12 h.p. "Sirdar" Phaeton to seat four.



CHASSIS. Four cylinders, bore 3 in., stroke 3½in., giving 12·5 brake h.p. at 1,000 revolutions, and developing fully 16 b.h.p. on acceleration to 1,500 r.p.m.; R.A.C. rating 14·3 h.p., four forward speeds and reverse; gate change speed; adjustable valve tappets; wheelbase 9 ft.; rounded radiator; high tension Bosch magneto; Ferodo sectional clutch; Claudel-Hobson carburettor; Austin detachable wheels; 810 x 90 Michelin tyres.

BODY AND EQUIPMENT. Phaeton body with leather upholstery and horse-hair cushions; Cape hood with side curtains; double folding glass screen with brass fittings; spare wheel and tyre; Lucas paraffin side and tail lamps; "Solar" mirror lens acetylene head lamps, with separate generator; speedometer and mileage recorder; horn, tyre pump, lifting jack, kit of tools and accessories.

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Engineering Notes and News.

Electricity in Mines.

The general report on Mines and Quarries for 1912 in the United Kingdom, by Mr. Redmayne, Chief Inspector of Mines, contains a report by Mr. Nelson, H.M. Electrical Inspector of Mines, from which it seems that electricity was newly introduced into no fewer than 56 mines, as against 46 in the year 1911, and of these as many as 31 were in Scotland. It is remarkable that the Scottish collieries should lead the way to such an extent; as for the other 25, seven were in the Northern Division, nine in Lancashire, North Wales and Ireland, and nine in South Wales.

As regards the electric shock accidents, Mr. Nelson says:—Of the eleven electric shock accidents above referred to, four took place on the surface and seven below ground. The two classes of accident will be considered separately, so that any conclusions it may be possible to draw shall have application to surface conditions and to underground conditions respectively. It may be remarked, in passing, that not since the year 1906 has the number of fatal electric shock accidents below ground been less than it was last year. The figures for the preceding five years may be of interest: 1907, 10; 1908, 12; 1909, 13; 1910, 15; 1911, 9; 1912, 7. When it is remembered that the use of electricity has greatly increased during the last five years, it is satisfactory to note that the number of fatal accidents has begun to show a downward tendency rather than the upward tendency, which appeared constantly until the year 1911. It is less satisfactory to reflect that of the seven fatal electric shock accidents which occurred below ground in 1912, at least *five might have been avoided by greater care in the maintenance of apparatus and stricter regard to the regulations.* (The italics are ours.)

1. *Surface Accidents.*—Of the four surface accidents, three occurred on medium-pressure alternating-current systems, and the fourth on a medium-pressure direct-current system. Two appear to have been due to working improperly on live apparatus with the full knowledge that the apparatus was live. The other two were due to misadventure in making contact with live parts. In one of the latter cases the victim made accidental contact with a bare trolley wire in boarding a charging machine from the top of a battery of coke ovens. In the other, the victim made accidental contact with a live switch in allowing his hand to rest vaguely on the switchgear controlling a haulage motor, of which he had charge. The latter was the accident which occurred on a medium-pressure direct-current system; the three first described were on medium-pressure alternating-current systems.

(2) *Underground Accidents.*—Of the seven underground accidents, one occurred on a high-pressure three-phase alternating-current system, five on medium-pressure three-phase alternating-current systems, and the remaining one on a medium-pressure direct current system.

SAFETY RULES—ELECTRICAL INSTALLATION.*

(1) Boxes, lined with approved non-combustible insulating material, should be provided for all switches, fuses, current breakers or other bare parts exposed to the weather, dampness or contact with inflammable material, or where employees are liable to make accidental contact with live parts. (2) Conduits shall be considered as a mechanical and fire protection only and not as an insulating medium. Provision should be made to prevent water getting in conduits. Only circuits carrying the same kind of current, at the same voltage, shall be run in one conduit. (3) Conductors should be of rail, bar or structural shape wherever practicable, so located, protected or guarded as to minimise the danger to men working near them. Wherever practicable, they should be painted yellow to distinguish them from ordinary structural work. (4) Circuit breakers of the contactor type or electrically operated should be used. Latches, blocks, etc., should not be used to prevent the circuit breaker from opening. Means should be provided to prevent unauthorised persons from changing the setting of the relays. (5) Disconnecting devices or switches should be provided for entirely disconnecting switchboards, oil switches, generators, etc., from all possible sources of power, including outgoing feeders, while men are working on them. (6) Fuses should be of the inclosed type. (7) Ground wires should be provided for frames and bedplates of generating machines, all electrically driven machinery, motors, switchboard frames and railings, etc. (8) Lightning arresters should be located in easily accessible positions at a sufficient distance from wires and other inflammable material to prevent danger of fire, and should be protected by non-combustible barriers, and should be guarded so that employees cannot come into accidental contact with them. (9) Lamps of the arc type should be constructed as nearly as practicable of non-combustible material, and should be kept supplied with globes. No portion of the lamp outside of the globe and casing, except the binding posts, shall be live. (10) Series arc lamps, and lamps hung on structural supports, should have insulating supports and be not less than 20 ft. above the ground. (11) Tungsten lights should be used when possible. (12) Incandescent lamps or clusters of 150 watts capacity and over, with reflectors or shades shall be suspended by a conduit, rod or other substantial support and should not depend upon electrical feed wires for support. (13) Incandescent lights on 125 to 275-volt two-wire circuits should be carefully installed. Sockets of 500 volts should be used, of the porcelain, composition, or weatherproof type, with glass or mica insulation. Brewery cord and duplex cable should be used for drop and portable lights, and it is advised that wires be taped a distance of 5 inches above sockets. Switches should be double-pole, preferably of the knife type. (14) Portable lamps should be installed only where absolutely necessary, and then wire guards should be provided over the lamps where there is gas or other combustible material, or where the lamp is liable to be broken and explode. (15) Motors should be railed off or otherwise guarded, wherever practicable, and armature shaft ends should be encased. (16) Rubber or wood-slat mats should be placed at the front of and in the back of switchboards. (17) Safety switches should be provided on all cranes, wherever the main switch and control is not within plain sight of the motor, and at all places where it is necessary for men to work out of sight. (18) Switches should be installed so that gravity will tend to open them rather than close them. Where practicable, switches should be mounted so that the blades are dead when the switch is open. (19) Automatic oil switches should be used in preference to air-break circuit switches on circuits of from 275 to 1,000 volts. In stations of 500 kw. capacity and over there shall be remote control, either hand or electrically operated. (20) All panel switchboards should be of non-combustible material, such as marble or slate, mounted on metal framework, which shall be self-supporting or rigidly braced. There should be not less than 4 ft. actual clearance between the equipment on the back of the board and the wall or other structures, and the ends of this space shall be guarded by railings or screens which will permit a clear view of the space back of the board. There shall be no doors, cupboards, stored material or obstruction of any kind behind the boards, and this space shall not be used as a thoroughfare. No live parts carrying a potential of over 275 volts shall be mounted on the face of the panels. (21) All exposed parts carrying a potential of from 275 to 1,000 volts shall be painted blue and those carrying over 1,000 volts shall be painted red, so as to make them easily distinguishable. (22) Warning signs shall be placed on all poles carrying a current of 275 volts or over. Where a lower current is carried on the same pole a high-tension danger sign shall be mounted on or immediately below the lowest crossarms carrying the high voltage. (23) Start-and-stop buttons or safety switches should be located at each machine so far as practicable. (24) On overhead transmission lines or open main wiring inside buildings, different types of insulators should be used for each separate class of service, so as to make circuits easily distinguishable for reasons of safety as well as for operation. (25) No live wire of any voltage shall be exposed in manholes. (26) Higher-voltage lines should always be located above those of lower voltage. (27) Lines should be installed so as to maintain a clearance of 22 ft. above standard-gauge tracks and yard level when supported on poles; when carried on viaducts, bridges or other structures they should preferably be installed in conduits. When not installed in conduits on such structures and when located above the structures they should be constructed to maintain a clearance of at least 8 feet above the floor or walkway level. They shall in all cases be so constructed as not to project below the lowest part of such a rigid structure. (28) Wires carrying over 275 volts and less than 3,000 volts shall not be run on crossarms with lines carrying a greater or smaller potential. They should be kept as far as practicable away from windows, platforms and other places where unauthorised persons can come in contact with them. (29) Feed wires above 275 volts shall not be carried through buildings, except where power is supplied to machinery therein, and in all cases should be of either conduit or underground construction. (30) Open or exposed mains shall be located so as to prevent injury to men having occasion to work in their vicinity. (31) No wiring shall be laid on top of floors, as it is liable to trip someone, and in connection with extension lights, the latter are liable to be pulled from their positions and explode. (32) All wires used during construction work and for all temporary purposes shall be removed as soon as the work is completed. If this cannot be done at once, the ends of the wires should be taped, to prevent possible short circuiting, and a danger sign should be attached thereto. (33) Flexible cord for lamps should be tied on iron rods or allowed to come in contact with water or oil.

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ELECTRIC MINE HOISTS.

Recent announcements are to the effect that American manufacturers have been entrusted with the design and construction of one electric mine hoist, the most powerful in the Western Hemisphere, and another the most powerful in the world. The hoist motor of the larger equipment, which was ordered for the Crown Mines on the Rand, is rated at 4.000 h.p. continuous delivery, but it is able to deliver 7.000 h.p. every other minute. It has a total weight of about 140 tons, and is divided into two duplicate units, one at each end of a drum, the largest diameter of which is 20ft. 8in. The motor speed is such that for a part of every trip the load of eight tons of ore will travel at the rate of about 39 miles per hour. Now the heaviest steam locomotive in use to-day of about 250 tons, can develop about 2,000 h.p. temporarily and 1,000 to 1,500 h.p. continuously. The schedule or time-table speed of long-distance express trains in the United States is highest on the Eastern railroads, 39 miles per hour is better than the actual performance of nearly all of them. Looking at it from another point of view, this speed corresponds to approximately 34 knots per hour, of which (barring racing motor boats) only the swiftest torpedo-boat destroyers are capable, and then for short periods only. The quantity of ore brought to the surface every hour by this hoist will be about 450 tons from a depth of 3.500 feet. The smaller outfit was ordered by the North Butte Mining Company for its Granite Mountain mine, and includes a motor with a peak capacity of 4.500 h.p. The maximum rate at which the ore will be hoisted out of the shafts is about 30 miles per hour. The ore will be brought to the surface at about the speed of a local railway train, or, stated differently, just as fast as the Mauretania and Lusitania with their 70.000 h.p. engines can steam in good weather. The hourly capacity will be 300 tons from the 2,000 ft. level, or 200 tons from the 4.000 ft. level. Thanks to the knowledge and perseverance of an American, H. Ward Leonard, each of these hoists can be started, stopped or reversed by one man in a few seconds by simply moving a light controller handle. With this invention the necessity for cumbersome, inefficient and expensive controlling apparatus ceased to exist. The essence of the idea consists in furnishing a generator for each motor and effecting the control by varying the field strength of the generator. With this system of control, there are possible safety devices which were either entirely impossible with steam, compressed air or other driving power or else were complicated and unreliable. A further advantage, which, however, applies to the electric hoist in general, is the ease with which accurate measurements of energy consumption may be secured. The power bill for an electric hoist is made up with the minimum of computation and the maximum of accuracy. While both the North Butte and the Crown Mines equipments employ the Leonard method of speed control, they differ in the way in which power is supplied to the generator, each being the representative of a popular type. The Crown Mines hoist motor is fed by a motor-generator set of large size but of standard design, consisting of a 5,000 h.p. induction motor and two 1.650 kw. generators; the whole equipment probably obtains on a busy hoist a maximum overall efficiency, but every variation of load on the hoist motor is transmitted through the motor-generator set to the supply circuit (the peaks being even increased by the losses in the set), so that an extremely unsteady demand on the line results. This arouses the criticism and opposition of the managers of all but the largest power companies, and we may not expect any general adoption of these outfits until the number of transmission systems of high capacity in the mining districts has increased. To meet the objection to a load with high peaks and low valleys, Mr. Leonard suggested connecting a fly-wheel to the motor-generator set. This expedient found favour in the eyes of a European manufacturer, Mr. Ilgner, from whom, on account of his early championship of the idea, it has taken its name. Such an equipment draws a much more steady current from the line, so that the criticism concerning fluctuating load no longer applies. An Ilgner set is not suitable, however, for a hoist the duty of which consists largely of standing service, because the light-load losses make the operating cost too high. At least three other expedients with the same end in view, namely, the smoothing out of the variations of the load, are in use. They are: Replacing the flywheel by a generator and a storage battery with the necessary accessories to charge and discharge the battery at the proper times; driving several hoist generators, or one hoist generator and one supplying power for other purposes, from one motor; and operating hoists and other machinery, such as air compressors, from the same motor. The success of the second and third methods requires that the heavy loads on all the machines shall not occur at the same time. For a great many mines, whether it be on account of the probable life of the property, size of the equipment, favourable power rate, or what not, the first cost of a Leonard equipment is not warranted, and in such places the hoist driven by a variable-speed motor connected directly to the line is rendering excellent service. The establishment on a commercial basis of the manufacture of high-speed, highly efficient helical gearing has increased the adaptibility of motors to this class of installations. Generally the motor is of the induction type with polar wound rotor, although alternating-current commutator-type hoist motors are about to emerge from the experimental stage. Another recent development, eliminating the variable-speed motor, is the combination of a constant-speed, continuously running motor and a hoist with slipping clutches. On account of its simplicity this type seems promising.

Rhodesian Railways.

Mr. Wilson Fox, as director of the Rhodesian Railways, recently addressed a representative meeting of the Rhodesia Chamber of Mines on the subject of the railway policy, and announced further reductions of rates for the benefit of the mining industry. Mr. Fox pointed out that railways, equally with the mines, had been affected by the restricted influx of capital owing to tightness of money. Rhodesia had been extremely fortunate in its backers. Had it not been for the fact that the principal backers had ample resources, the condition of affairs in the mining industry today might have been disastrous. They were now, he thought, about to emerge from the depression and enter into a period of great hope and expansion. Mr. Fox emphasised the demands for money for railway development, and discussed various alternatives of raising it. He said railway companies were not in a position to issue either preference capital or ordinary capital to the public. The credit of the companies must be gradually built up, and they had only just begun to pay debenture interest. More money, no doubt, would be raised by debentures for further railway extension, but it would not be an easy task, and the task could not at present be carried out. It would be hopeless to place second debentures on the London market. Mr. Fox defended the expenditure of earnings on railway development, and outlined the capital expenditure in the current year of £127,000. Mr. Fox emphasised the importance of the Beit railway bequest, without which it would have been difficult to build new lines. He deprecated railways borrowing from the Chartered Company, which must maintain large reserves, or else the country's credit would suffer. The Chartered Company had taken in hand a programme of development which implied continuous expenditure for seven years of a million and a half. Mr. Fox quoted figures to disprove the statement that the companies are making big profits, and reminded his hearers that not a penny had been paid to the shareholders of the Chartered or railway companies. He referred to past reductions of rates, showing the policy of progressive reductions. Articles on which further reductions were decided are cement, coal, mining machinery, dynamite, gelatine, etc., fuse lighters, calcium carbide, bicarbonate of soda, cyanide of potassium, detonators, sulphuric acid, glass, borax for assaying, lubricating grease, vegetable oils for lubricating purposes, pebbles for tube mills, and bullion. Mr. Fox also announced a reduction in passenger fares for natives, and a concession to small workers in the matter of the payment of labour capitation fees.

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The Portland Cement Industry.

The Portland cement industry appears to be in a bad way in other countries. In America, increase in consumption has been rapid, but plant construction has far outstripped the demand. The slump in building activity prevented the cessation in building of plants from correcting the difficulty. Millions of dollars are tied up in idle cement plants from which no income is being derived. The condition is not limited to the United States, it having been said that Belgian interests are offering cement in Philadelphia at 20c. per bbl. less than it can be delivered for after being purchased in eastern Pennsylvania at 90c. per bbl. This fact, however, would not influence the market, as Belgian cement would not meet requirements in that country, but the fact tends to substantiate statements of general over-production. The Rhine-Westphalia cement syndicate has not been renewed for 1914, a fact which has helped to demoralize the European trade. The members of the syndicate are still bound in certain ways until the end of the year, but the outside market has broken heavily, and when the railroad administration of Hanover recently asked bids for about 17,000 tons of portland cement, it was offered at prices ranging from 13c. to 16c. per 100 lbs., or less than half the recently prevailing prices. The Universal Portland Cement Co. has been reported as cutting prices in the West, but as they get 20c. to 30c. more per bbl. at the mill than other manufacturers, this does not make much difference. Portland cement at present is 90c. per bbl. in bulk at the mill. No change in price is expected for some time. Production for 1913 will be over 90,000,000 bbl., the largest in history.

* * * *

Serving the British Trader.

Before the Dominions Royal Commission, under the Presidency of Sir Edgar Vincent, evidence was given recently with reference to the organisation and work of the various branches of the Board of Trade for dealing with British traders and overseas business. Sir H. Llewellyn Smith, Permanent Secretary of the Board of Trade, gave details of the working of the Commercial Intelligence Department and the Advisory Committee of Commercial Intelligence. He said the system of Trade Commissioners in the overseas dominions had been very successful, but it was hoped to place this on a permanent basis, and the recommendations of the Royal Commission were awaited, in order that the matter might be submitted for the consideration and assistance of the Treasury. Many traders were not sufficiently enterprising to avail themselves of the services of the Board of Trade Intelligence Department. The idea of the department was that in each dominion there should be one responsible Commissioner, with branches under the control of whole-time assistants, but the Board did not think the system of paying "correspondents" by fees should be altogether abolished. The cost of the department was £20,000 a year, not including rent or any portion of the salaries of the central Board of Trade, or the commercial department of the Foreign Office, or the diplomatic and foreign service. The Trade Commissioners working abroad visited the United Kingdom occasionally in order to keep in touch with home traders through the London Chamber of Commerce and other such institutions. The witness thought an extension of the present system was desirable, but was not in favour of "the whole trade intelligence system being made an inter-Imperial institution."

* * * *

Mozambique Economics.

Captain Lisboa de Lima, now Minister of Colonies, at a recent meeting of the Geographical Society, Lisbon, gave a very interesting and important address on the economical and financial situation of the Province of Mozambique. He began by stating that it was good to see so many taking an interest in colonial affairs, and stated that he did not intend to praise or blame individuals but only to state facts. By documents taken from Mozambique statistics he showed the revenue of the Province of Mozambique was, in 1900-1901, £460,000, and that it rose in 1910-1911 to £1,200,000, owing to (a) The revenue of the Port and Railways of Lourenco Marques; (b) the revenue of the Customs from import duty on all merchandise for Lourenco Marques. If it were not, he said, for the actual progress of the Port and Railway, the town would revert to its old position of a convict station; (c) the revenue that the State collects from the native immigration to the Transvaal; (d) the revenue from the hut tax, which is generally paid with money which the natives bring from the Transvaal. and from the money received through the natives working at the Port and Railway of Lourenco Marques on the merchandise for the Transvaal. After deducting the receipts mentioned in "a," "b" and "c," and the major part of " ," the revenue, he said, of the Province of Mozambique for 1910-1911 had been stationery, and was reduced to a medium of £260,000, which means, without taking into consideration the traffic of the Port and Railway of Lourenco Marques and the native immigration to the Transvaal, the development in trade, commerce, agriculture, and industry has been very small in relation to the vastness of the Province. What he affirmed showed that the economic and financial life of the Province is absolutely dependent upon the life of the Transvaal. This he proved by figures; that all things which affect the Transvaal have a direct reflex on the life and State revenue of the Province.

Voluntary Liquidations.

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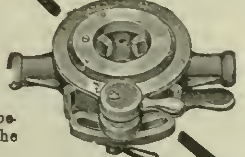

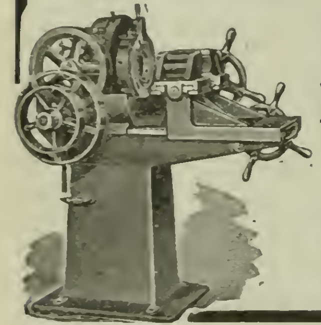

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THE WEEK IN THE SHAREMARKET.

A Marked Improvement—Barnato Stocks the Feature—Van Ryn Deeps and Modder Deeps in Demand.

With the lifting of the clouds in Home politics, the market automatically responded, and prices are higher all round. The improvement is accompanied by greatly increased business, and Barnato stocks provide a strong feature. Modder Deeps are also much in evidence and have improved substantially in quotation. Van Ryn Deeps have been the leading Barnato stock, and the prospect of a twenty shilling per ton profit is attracting investors in increasing numbers. The mine has been handicapped by the labour troubles, but is gradually getting into its stride, and during the coming months will doubtless realise handsome profits. Mr. Lawn's annual report, coming from so conservative an engineer, could hardly be more favourable than it is. Consolidated Langlaagtes are also being bought by investors, and the outlook for the mine is now most promising. The whole Far East Rand, with the exception, perhaps, of Brakpan, is enjoying increased favour, and bids fair to revive interest in the South African market generally. Tins are still quiet, and diamonds inactive. In both divisions, however an early increase in business is confidently expected.

	Fri., 27th.	Sat., 28th.	Mon., 30th.	Tues., 31st.	Wed., 1st.	Thurs., 2nd.
Adair-Ushers	—	0 5*	0 5*	0 5*	—	0 5*
African Farms	13 6*	13 6*	13 6	13 3*	—	13 3*
Apex Mines	17 9*	18 0*	18 0*	18 9*	18 9*	19 0*
Bantjes Consolidated	13 9*	13 6*	13 9*	14 3	14 6†	14 0*
Benoni Consolidated	1 8*	1 8*	1 9*	1 9*	1 9*	1 10*
Blaauwbosch Diamonds	90 0†	—	—	—	—	—
Breyten Collieries	29 0*	29 0*	—	29 0*	—	29 0*
British South Africa	—	—	19 0*	18 0*	18 0*	18 0*
Bushveld Tins	0 7*	0 6*	0 6*	0 6*	—	0 6*
Cassel Coals	—	13 0*	—	14 0*	14 0*	15 0*
City and Suburbans	47 6*	48 3*	48 3*	48 0*	48 0*	48 0*
City Deeps	58 6*	59 0	59 6	59 9*	—	61 6*
Cloverfield Mines	4 6	4 4*	4 5*	4 4*	—	4 6*
Clydesdale Collieries	9 0*	9 0*	9 0*	9 0*	9 0*	9 0*
Cons. Investment	—	—	21 0†	21 0†	—	19 6*
Cons. Langlaagtes	29 6*	30 0*	30 0*	30 3	—	30 3*
Cons. Main Reefs	17 6*	17 3*	17 3*	17 6	17 6*	17 6*
Cons. Mines Selection	8 3*	8 3*	—	—	—	8 0*
Coronation Collieries	—	—	—	—	—	21 0†
Coronation Freeholds	0 4*	0 4*	0 4*	0 5†	—	0 4*
Coronation Syndicates	3 3*	3 3*	—	3 6*	—	3 0*
Crown Diamonds	7 9*	8 0*	8 0*	8 0*	8 0*	8 0*
Crown Mines Debentures	—	£98*	£98*	—	—	£98*
Durban Roodepoorts	—	—	—	—	—	15 0*
East Rand Centrals	2 2*	2 2*	2 2*	2 1*	2 1*	2 2*
East Rand Coals	1 7	1 7*	1 7*	—	1 7*	1 8*
East Rand Deeps	1 5*	1 5*	1 5*	1 5*	1 6*	1 6*
East Rand Props.	37 0*	37 0*	36 0*	36 0*	36 0*	36 6*
East Rand Debentures	—	£86†	£86†	£86†	£86‡	£86†
Eastern Gold Mines	1 0*	1 0*	1 0*	1 2*	1 1*	1 2*
Frank Smith Diamonds	5 6*	5 9*	5 10*	5 9	5 9	5 6*
Geduld Props.	24 0*	23 9*	23 9*	23 6*	—	23 6*
Geldenhuis Deeps	—	25 0†	25 0†	25 0†	25 0†	—
Glencoo (Natal) Collieries	—	6 6*	6 6*	6 6*	6 6*	6 0*
Glynn's Lydenburgs	—	9 0*	—	9 0*	11 0†	11 0†
Government Areas	19 3*	19 3*	19 3	19 3	19 3	19 3*
Jupiters	4 6*	4 6*	4 9†	—	—	4 6†
Kaalfontein Diamonds	—	0 4†	—	0 4†	—	0 3†
Klerksdorp Props.	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Knight Centrals	10 0	9 11*	10 0	9 11	9 10*	9 11
Knights Deeps	31 0*	32 0*	32 6*	32 6*	32 6*	—
Lace Props.	3 1*	—	3 1*	3 2	3 1*	3 3
Luipaardsvlei Estates	—	—	9 3*	—	9 6*	9 6*
Lydenburg Farms	2 9*	2 9*	2 9*	—	—	2 7*
Main Reef Wests	6 9*	7 0*	7 6†	6 9*	7 3*	7 0*
Meyer and Charltons	—	105 0*	—	—	106 3*	—
Modderfontein B.	80 0*	78 0*	—	—	—	81 3*
Modderfontein Deeps	43 9	44 0*	44 9	44 6*	44 3	45 9
Natal Navigation Colls.	16 0†	15 0*	—	—	15 0*	15 0*
New Bokshurgs	0 10*	0 10*	—	0 10*	—	0 10*
New Eland Diamonds	—	—	27 0†	25 0*	—	25 0*
New Era Cons.	5 6*	5 6*	5 9*	—	5 6*	—
New Geduld Deeps	1 10*	1 10*	1 10*	1 10*	—	1 11*
New Gochs	—	—	—	—	10 0*	—
New Heriots	—	—	—	—	54 0*	56 6*
New Kleinfonteins	23 0*	23 3	23 9*	24 3	23 9*	24 0*
New Modderfonteins	240 0*	—	—	240 0*	240 0*	240 0*
New Unifieds	—	—	13 0*	—	—	—
Orange Diamonds	1 5*	1 4*	1 6†	1 6†	1 6	1 6†
Piggs Peak	—	—	10 0*	10 0*	—	10 0*
Pretoria Cements	45 6*	47 0†	47 0†	47 0†	45 0	—
Princess Estates	4 9*	4 9*	4 9*	—	4 9*	4 9*
Rand Klips	2 4*	2 6	2 3*	2 4*	2 4*	2 4*
Rand Nucleus	1 3	1 7*	1 7*	1 7*	—	1 8*
Randfontein Deeps	3 5*	—	3 4*	3 4*	3 3*	—
Randfontein Estates	23 0*	23 6†	22 0*	22 0*	—	23 0
Robinson Deeps	28 6*	28 6*	28 6*	29 0	—	29 0*
Rooiberg Minerals	25 6*	25 0*	25 0*	25 0*	25 0*	25 6*
Ryan Nigels	2 9*	2 9*	3 0†	3 0†	—	3 0†
Shebas	4 9*	4 9*	4 9	4 9*	4 9*	4 9
Simmer Deeps	2 0†	2 0†	—	—	—	—
S.A. Breweries	41 0†	41 0†	41 0†	41 0†	41 0†	41 0†
S.A. Diamonds	30 0*	30 0*	30 0*	30 0*	—	—
S.A. Lands	3 0	3 0	2 11*	2 11*	—	2 11*
Springs Mines	—	—	—	13 6*	—	13 9*
Sub Nigels	10 9*	11 0*	11 0*	11 0*	11 3	11 6
Transvaal Coal Trust	28 0*	27 6*	27 6*	28 0*	—	28 0*
Transvaal Cons. Lands	—	—	19 6*	—	—	—
Transvaal G.M. Estates	42 0*	41 9*	42 6	42 6*	39 0*	40 0†
Tudors	—	1 0*	—	1 0*	—	—
Van Dyks	1 0*	1 0*	—	1 0*	1 0*	—
Van Ryn Deeps	42 3*	42 9	43 6	43 3	43 3	43 9
Village Deeps	35 0*	35 0*	—	—	—	35 6*
Vogelstruis Cons. Deeps	1 0*	—	0 9*	0 9*	—	0 9*
West Rand Cons.	—	7 6*	7 6*	7 6*	—	7 6*
Witbank Collieries	43 3*	43 6*	45 0†	—	—	42 6*
Witwatersrands	66 0*	66 0*	63 6*	66 6*	66 6*	67 6*
Witwatersrand Deeps	50 0*	50 6*	51 6*	51 6*	54 0†	52 6
Wolhuters	15 3	15 0*	15 0*	15 3*	15 6	15 9
Zaaiplaats Tins	26 6*	26 0*	26 6*	27 6*	28 0*	29 0

*Buyers. †Sellers.

MINING MEN AND MATTERS.

Mr. K. Taylor, a director of Sandycroft, Ltd., is visiting the Rand next week.

* * * *

Mr. H. M. Bellamy, of Messrs. Hubert Davis & Co., left this week for England.

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A sub-office of the Inspector of Mines, Cape Province, has been opened at Port Elizabeth.

* * * *

Mr. A. C. Allen has been returned at the head of the poll for membership of the Committee of the Stock Exchange.

* * * *

Mr. W. McC. Cameron, Consulting Engineer to Messrs. A. Goerz & Co., Ltd., goes on a well-earned six months' holiday next week.

* * * *

The list of certificates issued by the Mines Department for fortnight ending 28th March, 1914, is as follows:—Mine Overseers (Metalliferous Mines): F. C. W. Ingle, D. G. Malherbe, W. T. Harry, E. S. Marshall.

* * * *

A memorial to Lieut. Claude Bettington, R.F.A. and R.F.C.—son of Colonel Bettington—who was killed when flying on duty at the military manoeuvres in England on September 10, 1912, was unveiled at St. George's Church, Parktown, on Sunday.

* * * *

The offices and secretaryship of Blaauwbosch Diamonds, Ltd., have been removed to the South African Diamond Corporation, Ltd., Lewis & Marks Building. Mr. T. E. Duckles, who was secretary of the company since its inception in 1908, is carrying on his usual secretarial work in his own offices at 82/84 Exploration Building, and will have the secretaryship of two new and interesting companies during the course of the month.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

May 6.—Van Dyk Proprietary; Lancaster West; Tudor; Modder Deep Levels; Geduld Proprietary; Princess Estate; May Consolidated (annual).
May 20.—Apex Mines, New Kleinfontein (Annual)
May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).
May 27.—Consolidated Langlaagte Mines; Ginsberg; Glencairn; Government Areas; New Primrose; New Rietfontein; New Unified; Van Ryn Deep; Witwatersrand G.M. (annual).
June 23.—Transvaal Consolidated Lands (annual).
June 17.—S.A. Gold Mines; Leeuwpoort Tins; African Farms.

The Week's Company Meetings.

WOLHUTER GOLD MINES.

Annual Meeting.

The annual meeting of the Wolhuter Gold Mines, Ltd., was held last week in the board-room, Cullinan Buildings. Mr. W. H. Dawe presided, and the other shareholders present were: Messrs. E. Collins, J. Jourdan, S. C. Black, R. Goldmann, E. Renaud, W. T. Graham, B. Moses, J. R. Nicholson, M. Honnet, F. W. Baxter, A. E. Adams and A. Gregor, acting-secretary. The share representation was 109.931 out of an issued capital of £60,000.

Chairman's Speech.

The Chairman said: The reports of the directors, consulting engineer and manager, together with the financial statements for the year ended the 31st of October, 1913, have been in your hands for some time, and I take it have received your consideration. In moving their adoption, I wish to refer to some points in connection with the past year's working, and to one or two questions of general interest; also to make some reference to the operations carried on since the close of the financial year. As a result of the present method of procedure a considerable time elapses between the close of a company's financial year and the date of the annual meeting, and consequently it would be somewhat unsatisfactory if one confined one's remarks entirely to the reports and statements before you.

RE-NAMING SHAFTS.

Before dealing with the past year's results, I wish to explain a change which it is intended to make in connection with the nomenclature of the shafts on your property. The names by which the company's shafts have been referred to up to the present time have become misleading, but though your consulting engineer wished to make a change we hesitated to do so till there was an opportunity to explain the reasons for effecting the alteration. Originally there were but two shafts on the property—one near the west boundary, on the mijnpacht section of the property, which was always referred to as the main incline; the second, which is 850 feet to the east of the main incline shaft; was named the east incline. Subsequently a third shaft was started, on the eastern portion of the property, which has always been referred to as the deep level, or main vertical, shaft. In regard to the main incline, I would point out that, owing to the shape of your property, this shaft has long since been completed, and, at the present time, is used to only a limited extent. If, however, it should be necessary to refer to it, it could be called the Mijnpacht shaft. Regarding the two shafts which are in use at the present time, it will simplify matters very considerably if the deep level shaft be referred to as the eastern shaft, and the shaft which has been known as the east incline as the western shaft—and in the quarterly and annual reports issued after this date this naming of the shafts will be adopted.

DECREASE IN TONNAGE.

Turning to the results obtained from the past year's working, we find, on comparison with the figures of the previous financial year, that there was a decrease in the tons milled of only 6,100 tons, but the yield averaged 1s. 3.6d. less, and the costs 10.4d. more, these differences together resulting in a reduction in the profit of 2s. 2d. per ton. Your consulting engineer attributes the increased cost of mining to the more broken ground encountered in the eastern section, which necessitated additional subsidiary development, and also reduced the tonnage efficiency of those employed in that section of the property. The value of the payable ore exposed during the past year is practically the same as for the previous year, but the tonnage was 14,000 tons less, and this decrease is due to the fact that the south reef has been disappointing. The development footage accomplished was 10.849 feet (an increase of 310 feet on the footage for 1912), resulting in the exposure of 330,763 tons, having an estimated average value of 6.1 dwts. over 54.5 inches. They payable ore reserves stood on the 31st of October last, at 784,100 tons, with an average value of 6.1 dwts. over 51.5 inches, as against 832.977 tons, of an average value of 6.4 dwts. over 50.7 inches, on the 31st of October, 1912. The main reef leader, west of the eastern shaft, has given consistently good values on all the lower levels. The auxiliary shaft from the 20th level of the eastern shaft has been carried down to beyond the 22nd level, and this work will be continued as rapidly as possible in view of the fact that the eastern portion of your property is the section which has the greatest bearing on the future of your company. The assay results which have been obtained on the 20th, 21st and 22nd levels I will refer to later.

EUROPEAN SHAREHOLDER'S LETTER.

This is brieflly an outline of the most important items of information embodied in the reports of the consulting engineer and the manager, and before going on to other matters I might mention that I received a letter from a shareholder in Europe, in which I am asked to deal with two or three points arising out of the reports. The first two refer to the decrease in the yield and the quantity of the ore reserves, and to the increase in the working costs; but I think it is impossible to give a fuller explanation than that already submitted, and also that you will recognise the adverse effect which results when mining operations are hampered by broken ground, such as I have already mentioned. My correspondent mentions that these two points seem to be in contradiction of the hopes expressed at the last annual meeting, but though the increase in the monthly profit from March to October last year was not great, a comparison of the figures shows that there was an improvement, and that the position was steadily maintained—always excepting the month of July, which was naturally affected by the industrial disturbances which took place at that time. The third point raised is in connection with the capital expenditure, which my correspondent considers too high. In this connection I would point out that out of the expenditure of £29,369, £8,123 was the cost of shaft sinking; £6,909 was incurred in connection with buildings; that is to say, we were obliged to spend this sum on the native compound, in order to conform to the Government regulations. Your company's compound was an old one, and this expenditure was unavoidable. The largest item of capital expenditure—in connection with machinery and plant—was mentioned at the last annual meeting, when it was explained that an electrically driven compressor of 38-drill capacity, was being installed, and that the capacity of the cyanide plant was being increased. The compressor was installed to allow of running an increased number of drills, thus making provision for any shortage of native labour, which, as you are aware, is always felt at certain seasons of the year. In addition to this fact it is well to bear in mind that within the past twelve months considerable improvements have been made in small hammer drills, and if the anticipations, which are regarded by our technical advisers as quite reasonable, be fulfilled, it will not be long before these small drills will be used to a very much greater extent than they are at present, with a considerable saving of expenditure. With regard to the capital expenditure likely to be incurred during the current year, I might say that it will show a very considerable reduction when compared with the year under review. Shaft sinking, it is true, will continue until earily in 1915, but after that date there will be no further expenditure on that account. The profit for the year, as shown in the revenue and expenditure account, amounted to £139,398; two dividends were declared, together equal to 10 per cent. for the year, which absorbed £86,000; the contribution to the Miners' Phthisis Fund amounted to £5.719; the Government tax on profits was £14,298. The credit balance carried forward from the 31st October last was £38,211, as against a credit balance of £40,333 at the end of 1912.

INDUSTRIAL TROUBLES.

At this date it would serve no good purpose to deal at length with the strikes which occurred in July of last year and in January last. In regard to the former, the seriousness of the position was, unfortunately, not recognised by the Authorities in time to prevent grave disturbances, but the lesson learned from this experience was not thrown away, and in January last protective measures were adopted, which resulted in the strike collapsing very quickly, and which were also satisfactory because these measures prevented the strikers from interfering with those who wished to continue working. A proposal is under consideration for the adjustment of the boundary line between the City Deep, Ltd., and your company. The area in question is less than one claim, but the squaring of the boundary will facilitate the working of the lower portion of your property.

MAIN REEF LEADER.

I have now to refer to the results obtained from the development on the main reef leader on the lower levels in both the eastern and western sections; and I think the detailed information which I am able to submit to you is the best reply that can be given to the question put to me as to whether the reefs are becoming impoverished in depth. Regarding the western section, driving west, on the 20th level, from the west shaft, has, for 1,015 feet, given an average value of 10.2 dwts. over 53 inches; while the same level going east, from the west shaft, for a distance of 995 feet has given an average of 8.9 dwts. over 50 inches. On the 21st level, from the same shaft, a total of 965 feet driven east and west has given an average of 8.7 dwts. over 54 inches. These figures show conclusively that in the western and central sections the values on the main reef leader are entirely satisfactory. Regarding the developments on the main reef leader from the east shaft, 330 feet on the 20th level, east of the shaft, exposed by boxholes, gave an average of 3.3dwts. over 40in.; and a further 240ft., exposed by driving, gave an average of 3dwts. over 59in. 230ft. driven east and west on the twenty-first level from this shaft gave an average of 4.3dwts. over 51in.; while 65ft. driven east and west on the twenty-sevond level have given 13.0 dwts. over 50in. Immediately below the leader on this lowest level the main reef has been partly exposed, and shows an average value of 5.5 dwts. over 34in. for the whole distance, the main reef leader and the main reef together giving an average value of 9.3dwts. over a stoping width of 84in. It will thus be seen that while the main reef leader on the twentieth and the twenty-first levels is distinctly poor in this section, a very satisfactory improvement is shown on the twenty-second level; and in the opinion of your consulting engineer this development has a most significant bearing on the prospects of the eastern section, which must figure so largely in the operations of your company in the future. Regarding the south reef, I can only reiterate the statement made by your consulting engineer in his report, that the results have been disappointing; if any exception has to be made it must be in regard to the values obtained from the twentieth level east from the western shaft, where 745ft. gave an average of 6dwts. over 54in., and also on the twenty-first level going east from the western shaft, where 90ft. of driving gave an average of 5.9dwt. over 71in. For the first two months of the current financial year the costs have approximated more closely to the costs of 1912, namely, 17s. 5.9d., and the profit for each of these months exceeded £13,300. I have purposely omitted January and February, as they were affected by the conditions then existing. At the same time, February, though a short month, showed an improvement on January, and there is every reason to hope that the results for the present month will be still more satisfactory, as we expect to mill 34.000 tons.

FULL NATIVE LABOUR SUPPLY.

It is pleasant for me to be able to make what is quite an exceptional statement in connection with the Rand gold mining companies regarding native labour, and that is, that at the present time your company has its full complement of natives. Before concluding my remarks I should like to draw your attention to a paragraph in the consulting engineer's report, in which he gives his reasons for stating that, given stable industrial conditions, the tonnage milled should be greater, the costs per ton less, and the profits during this financial year should be substantially better than those of the past year. In June last Mr. S. C. Thomson, who has been consulting engineer to your company for many years, resigned that position preparatory to his leaving the country, and Mr. D. Wilkinson, who has been associated with the mines of the Neumann Group since 1903, was appointed to fill the vacancy. On behalf of your board I must express appreciation of the services rendered by Mr. Thomson during the period he was connected with the company, and in regard to the present, it is almost unnecessary for me to assure you that the affairs of your company are safe in the hands of such experienced men as Mr. Wilkinson, the consulting engineer, and your manager, Mr. J. E. McGuire. I now beg to move the adoption of the reports and accounts as submitted

The report and financial statements were adopted unanimously.

The directors, Messrs. W. H. Dawe, C. S. Goldmann, E. A. Wallers and Sir George Farrar and Messrs. J. H. Ryan, S. C. Black, E. J. Renaud, W T. Graham, F. G. C. E. Robellaz, and A. G. Gill, were re-elected, and the auditors, Messrs. A. Eckart-Beckmann and H. J. Macrae, were reappointed.

SIMMER DEEP.

Annual Meeting.

The seventh ordinary general meeting of shareholders in the Simmer Deep, Ltd., was held last week in the board-room, Consolidated Gold Fields Buildings. There were present Messrs D. Christopherson, chairman, W. S. Smits. D. W. Rossiter, E. J. Renaud. J. E. Kent, F. Leslie Brown, J. Jourdan. F. M. Cowan, and J. D. Low, secretary. There were represented 557.515 shares out of the issued capital of 1,650,000 shares.

Chairman's Speech.

The Chairman said the report and accounts now placed before them show that the first debenture issue of this company has been reduced to £604.400, while the second debenture issue stood, at the 31st of December, at £262,500. To make up the number of debentures required for the annual redemption in October last first debentures of a nominal value of £26,400 were purchased in the open market at a saving to the company in both interest and redemption of some £10,000. Since the close of the year a further £5,700 of first debentures and the total number of second debentures required for the annual drawing in April next have been purchased at prices showing a considerable saving. You will notice on the credit side of the balance sheet that investments show a marked decrease. This is due principally to the sale of your company's holding of Victoria Falls and Transvaal Power Company, Limited, preference shares. Your directors having had an offer to take over the whole of the holding of these shares considered it advisable to accept same in order to increase the cash reserve of the company. The operations of the company for the twelve months ended the 31st of December, 1913. resulted in a working profit of £45.294, to which has been added sundry revenue amounting to £10,880, making a total of £56,174, as compared with the total profit of £49,577 for the year ended the 31st of December, 1912. After deducting debenture interest and expenses and certain amounts written off for depreciation, in all amounting to £51,189, a net profit is shown for the year of £4,985. The average recovery per ton shows a decrease of .346 dwts as compared with 1912. Against the decrease in the average recovery a reduction is shown in the working costs of 1s. 6d. per ton, the average working costs for the year being 14s. 10d. as against 16s. 4d. in 1912. This reduction is principally due to economies underground, though there is a declrease of approximately 3d. per ton in the cost of surface treatment.

ORE RESERVES.

The ore reserves at the 31st of December, 1913, were estimated at 1,416,000 mine tons fully developed of an average value of 4.25 dwts. per ton, and 254,000 mine tons partially developed of an indicated value of 4.4dwts. This shows a decrease in the fully developed tonnage of only about 14,000 tons as compared with 1912, but the value is very slightly improved while the increase in both tonnage and values (4.4dwts. as against 4.08dwt. in 1912) of the partially developed ore is a satisfactory feature. It is also satisfactory, in view of the disturbed industrial position during our last financial year, that the management has been able practically to maintain the fully-developed ore reserves at the same figure as last year.

LABOUR CONDITIONS.

Speaking generally, therefore, results for the year under review show an improvement, but not to the extent which might have been expected had it been possible to maintain the scale of operations reached in the early month of last year. At the last annual meeting I stated that the native labour conditions were at that time improving and this was being reflected by the better profits being made. These improved profits were maintained until June. The average number of natives employed during those six months was 4,322 as compared with an average of 3,469 during the last six months of 1912. After June, however, owing to the industrial disturbances in July, when recruiting was stopped by order of the Government and the disquieting effect they had on the native mind, the number of natives employed has steaily fallen until in February, 1914, there were but 2,826 natives in the company's employ. Your company has naturally severely felt the effects of this reduction in the native labour force, as the following figures show. During the first six months of the year an average of 62.500 tons were crushed each month, working costs averaged 14s. 5d. and the monthly profit from working averaged about £5,800; during the second six months only an average of 55,800 tons per month were crushed, while working costs were 15s. 2d. and profits fell to an average of £2,100 per month. Here again we think Mr. MacGregor, the manager, deserves much credit for having maintained so high a tonnage crushed with such a reduced native labour force. In October last, owing to the Jupiter Gold Mining Company having closed down operations, your company arranged to hire such portions, as it might require, of that company's reduction works. In addition to providing an appreciable increase of profits, it was thought that when labour conditions improved this arrangement would give a good opportunity of testing what the mine is capable of doing when crushing on a large scale; but so far it has not been possible to carry out this programme owing to the shortage of labour. The firm attitude taken up by the Government during the January strike in suppressing disorder and affording protection to the workmen who wished to work has, however, no doubt served to restore to the mind of the native a certain amount of confidence lost in July. This is more especially indicated by the larger number of voluntary boys aagin coming to work on these fields during the last few months. This, in addition to an increase in the number of boys being sent forward by our recruiters, has accounted for a small but steady increase during the last few months in the total number of boys employed on these fields by the industry, though, as I have shown, your company has not so far felt the benefit of any improvement in this direction.

ADVANCES TO NATIVES STOPPED.

The Native Affairs Office have issued instructions that after 30th June next no further advances to natives will be allowed to be given them before they leave their homes to come and work. It is to be sincerely hoped that the Government will reconsider its decision and allow advances up to £5 to be made. All the reports received by the Native Recruiting Corporation from their head officials who are constantly travelling about the Native Territories strongly recommend this. It so often happens that the native finds it necessary to arrange money matters for his family, etc., before leaving, and unless he can do so he prefers to stay at home, and, in many cases, share the distress of his family rather than leave them without any provision for the future. Owing to the natural improvidence of the native, there are a large number who find themselves in this position. The natives themselves ask for advances, and they are supported in the request as being reasonable, not only by their own headmen but by some of the Resident Magistrates. The Local Authorities must naturally wish to see the family of the wage-earner provided for during his absence in order that relief should not have to be forthcoming from elsewhere. It is a matter of first importance to your company that it should have sufficient native labour to enable it to carry on its reduction operations on a large tonnage basis as owing to the low grade on which we have to depend, it is only by this means that the property can be advantageously worked and the debenture charges met. To-day the company is not making sufficient profit to cover its debenture charges, and unless we can obtain an increase in the native labour force, it will not be many years before our funds become exhausted and we are unable to meet our liabilities.

CURRENT YEAR.

As regards the prospects for the current year, you will realise from what I have just said, profits must depend on the amount of native labour available, but it is satisfactory to note it is the opinion of your superintending engineer that the prospects of the mine are on the whole more promising than at the time of the last report. Development on the western section continue to expose a better grade of ore than2is being opened out in other parts of the mine, while on the eastern side the continued prospecting has indicated that further development may open up payable sections on the south reef. It is to be hoped during the present year, given sufficient native labour and industrial peace, the management will have an opportunity of seeing to what extent profits can be made on the bigger tonnage which the extra plant will allow us to put through. I cannot conclude without expressing our appreciation of the services during the year of Mr. MacGregor, your manager, Mr. Barclay, who acted during Mr. MacGregor's absence, and the staff both underground and surface. It has been a difficult and trying period and it is due to their untiring efforts that the operations of your company have not suffered during the past year to a greater extent than has been the case, and the thanks of the shareholders are due to these gentlemen. I now beg formally to move the adoption of the report of the directors and statement of accounts.

Mr. Renaud seconded, and the report and accounts were adopted.

Messrs. D. Christopherson and W. S. Smits were re-elected directors, and Messrs. T. Douglas and C. Stuart auditors, the remuneration for the past year's audit being fixed at two hundred guineas each.

THE JUPITER.

Annual Meeting.

The fourteenth ordinary general meeting of shareholders in the Jupiter Gold Mining Company was held last week, Mr. D. Christopherson presided and there were present Messrs. C. Distel, M. Honnet, W. S. Smits, D. W. Rossiter, F. Leslie Brown, J. E. Kent, J. R. Nicholson, F. M. Cowan and J. D. Low, secretary. There were represented personally and by proxy 276,768 shares out of the issued capital of £1,032,000.

The Chairman's Speech.

The Chairman, in moving the adoption of the directors' report and statement of accounts, said: The items in the balance sheet now before you do not call for any special mention with the exception of the item of £36,041 which appears on the debit side as a reserve and which includes the proceeds of the gold recovered from the final clean up of the plant, gold in reserve at the date of closing down, development reserve and sundry credits. This figure shows an increase of some £23,334 over the reserves at the 31st of December, 1912, which increase is almost entirely represented by the gold recovered from the plant. We propose to keep this amount in reserve till the board shall otherwise determine. At the last annual meeting I stated that the board of directors, in view of the low average value of the ore reserve, had been considering the advisability of increasing the capacity of the reduction plant, in order to bring a larger tonnage into the pay limit, and that, owing to the improvement in the native labour position, it was proposed, with as little delay as possible, to place the necessary orders for the additional plant. It was hoped thereby to work at a profit ore going as low as a mine value of 4.1dwt. The necessary financial arrangements had been made and were based on the assumption that profits would be maintained at £4,000 a month till the work of increasing the plant had been completed, though to maintain these profits would have meant encroaching somewhat on the higher valued ore reserves. Tenders were called, and orders had been, and were being, placed for the additional plant, when the July strike intervened.

UNSETTLING EFFECT.

As you are aware, the events of July had a most unsettling effect on the native mind. A large number of natives returned to their homes and spread stories which were no doubt exaggerated as to what had happened, with the result that natives who were previously thinking of coming up decided to stay at home until more favourable reports were received. Apparently also natives who remained working here realised that conditions on the Witwatersrand were still unsettled, for we received information that boys who returned home some time after July were telling their friends that the trouble was not yet over—which subsequent events proved to be true. In view, therefore, of the unsettled conditions, and the certainty that the shortage of native labour would continue for some time to come, it became clear that it would not be possible to maintain the required rate of profit during the construction period, and moreover it did not seem at all likely that it would be possible, even if the additional capacity were installed, to realise the low working costs which were originally anticipated as the result of the increased scale of operations, and, on which the success of the scheme was based. The board therefore, did not feel justified in proceeding with the scheme to increase the tonnage, and, failing that, had to consider what was the best course to follow in the interests of shareholders. The various alternative schemes, which were considered, are set out at length in the circular to shareholders dated the 3rd of October, 1913. Milling operations might have been continued at a profit for a time by extracting a larger tonnage from the richer sections of the mine; but, at least, especially if native labour became more scarce, there was uncertainty as to profit, and, further, the effect of such a policy would have been that after a comparatively short time the average grade of the ore remaining in the mine would have been reduced to a scarcely payable value.

DECISION TO CLOSE DOWN.

After consultation with some of the largest shareholders, it was decided to close down the property until conditions became more favourable. Before closing down it was advisable to mill the mine rock and sweepings already broken. The cost of dealing with such ore was materially less than normal as there was no breaking cost to be charged, but only transport and ore treatment. In addition, the grade showed better than the average. This, together with less development charged to working costs, accounts for the abnormal profits made during the last few months of the crushing operations. All gold in the plant was cleaned up as far as possible, and a further £22,500 was recovered from this source, with the result that your company is now in possession of some £96,000 cash the interest on which, together with the return on investments, and sundry revenue from rents and loan of plant, will, it is hoped, cover all current expenditure. An arrangement has been entered into with the Simmer Deep whereby that company can lease such proportion of the company's reduction works as it may require. This arrangement may be terminated at any time, by giving three months' notice.

SETTLED CONDITIONS WANTED.

As you will see in Mr. Leslie's report, the prospects of resuming work must depend on such quotations as settled conditions of labour and an increase in the native labour supply. Till this latter question is more assured, it is impossible for your company to attempt to raise the cash necessary to increase the scale of operations, and to do the development work which such increased scale would call for, and, in the meantime, it is unlikely that your directors will recommend encroaching on the cash reserves by attempting to start work with the present erected plant. Mr. Leslie points out that, in resuming operations, the cost will have to be incurred of replenishing the underground reserves of broken ore, and further it must be remembered that £22.500 of the cash represents gold won by the clean up of the whole plant and a large percentage of gold will again have to be absorbed by the plant when the mill restarts. I beg to move the adoption of the report and accounts.

Mr. Rossiter seconded the motion, which was carried unanimously.

The retiring directors, Messrs. H. C. Boyd and D. Christopherson, were re-elected, and the appointment of Mr. Max Honnet as a director in the place of Mr. F. Boerckel, resigned, was confirmed.

Messrs. T. Douglas and C. Stuart were reappointed auditors and their remuneration for the past audit was fied at a hundred and twenty-five guineas.

EAST RAND DEEP.

Annual Meeting.

The annual general meeting of shareholders in the East Rand Deep Company was held in the board-room, Jeppe Arcade, last week.

Chairman's Remarks.

Mr. Julius Jeppe, chairman of the company, presided, and among those present and represented by proxy were: African Farms, Limited, Messrs. A. Barker, E. Friedlander, and E. M. Hyman, Mrs. J. H. Mendelsohn, Mr. G. Parkes, Captain E. Wood, Sir John Barker, Messrs. Carrie and Paton, L. Ehrlick, Sim Greyham, H. I. Higham, H. G. Latilla, E. S. Marcus, H. G. Payne, A. Ries, C. J. Roberts, J. W. Shaw, A. E. N. Ward, G. W. Yardley, J. H. Ryan, B. Southwell, and O. F. Brotherton, secretary. In all 193,739 shares were represented out of a total issued capital of 500,000 shares.

In moving the adoption of the report the Chairman said: I regret to say that I have got nothing to add to what is contained in the directors' report and the accounts in your hands. You are well aware that the general condition of things obtaining here during the last year was not of such a nature as to induce the inflow of new capital, and your directors were therefore compelled to continue the policy of masterly inactivity which we have adopted during past years. The redeeming feature is that our cash and liquid assets produced nearly sufficient revenue to pay the current annual expenditure; you will observe that the entire expenditure for the year amounted to £1,816 (leaving out shillings and pence), out of which £1,041 was paid for licences on your claim-holding, the balance of £775 representing the actual cost of administration, of which £174 was paid for the London office; your interest and rent amounted to £1,553, so the deficit for the year—not taking into account the temporary depreciation of stock (or what we hope to be temporary)—was £263.

The report and statement of accounts were adopted.

The retiring directors, Messrs. G. C. Fitzpatrick and J. H. Ryan, were reelected, and Mr. A. E. A. Williamson was reappointed auditor.

CASSEL COAL.

Dividend of 5 per Cent.

Prosperous State of Affairs.

The annual meeting of the Cassel Coal Company was held in Lace Buildings this week. Mr. J. Dale Lace presided, and those present and represented by proxy included Sir Abe Bailey, Messrs. Julius Jeppe, J. H. Ryan, E. H. Lambe, E. Molyneux, W. Nelson, L. Edwards, W. Ross and A. Howat.

Chairman's Speech.

In moving the adoption of the report the chairman said: It is satisfactory to be able to state that the company's earnings for the period closely approximate to those of the previous year. This is naturally the most interesting point in the accounts from a proprietors' point of view. So when we find that despite many adverse circumstances, including the stoppage and subsequent dislocation of business consequent on the labour troubles of July, 1913, we were yet able to earn a net profit of £19,420, as against the previous year's £20,872, shareholders will find no cause for complaint. As I told you on the last occasion on which I had the privilege of addressing you, your board had determined on a forward policy in respect of your Landau property. That policy crystallised in the installation of a new mine with complete and thoroughly up-to-date adjuncts in the shape of machinery, headgear, and appurtenances on a portion of the farm Klipfontein, No. 166, about a mile and a quarter distant from the existing workings, which latter have been connected by railway with the new mine.

New Works Nearing Com

These extensive works are now far advanced towards completion. We commenced winning coal from the new shaft some few months ago, and I am pleased to be able to inform you that both as to width and calorific value the product of the new mine is fully equal to that of the old one—the high standard of which has caused Cassel Coal to become almost proverbial for excellence. You will see this point referred to in the manager's report in the terse sentence, "the coal is of the usual Landau quality and thickness," but as non-resident shareholders may not attach to that remark the importance it deserves, I make this reference to it. I told you last year that it was the board's intention to carry out the installation of the new mine out of profits earned by the old one, and to do so without incurring any fresh financial obligations. That, gentlemen, has been done. Our financial resources are sufficient to enable us to complete our undertaking without seeking any extraneous aid. And not only that, but we have been able to declare a dividend of 5 per cent. to all shareholders registered as at the 31st of December, 1913. This rate is a slight reduction on that of the previous year, but when shareholders reflect on the considerable asset we have given them in the new mine and its equipment, and the great increase in the earning power of the company consequent thereupon, I am confident they will view the trivial sacrifice with equanimity. As to what the enhanced earning power will be I will quote Mr. Barlow's estimate of the output from the new mine, and the dates when it may be expected to be available for market. He considers that by the end of August he will be able to give us an output from the new shaft of 38,500 tons per month. In addition to this we shall, of course, be able to produce coal from the old mine for some time to come. Into the question of selling prices and working costs it is not advisable to go, for business reasons which will occur to you. It is a matter for concern to all coal proprietors in the Middelburg district that their product, which is admittedly of high quality, should not realise a better price than it does. I am convinced that it will do so ultimately when it is better known in the world's markets, and for that reason I am again impelled to express my regret that the Railway Administration have not yet seen their way to give us such an export rate of freight as will enable us to establish our Overseas trade more quickly and stably than the present facilities permit of our doing.

Necessity for Markets Overseas.

We feel this the more because we must for the immediate future at all events look across the seas for markets. There is not as yet much scope for expansion of our trade within South African borders. Our population increases but slowly, and expansion from a manufacturing point of view has not hitherto made the great strides we still hope to see. Some day, the fact that we have huge deposits of good coal, rich iron ore, and limestone in close proximity to each other and to Railway transport, must bear fruit, and when it does, the large extent of your proved coal area will enable us to share in the rewards. Meantime, as I said, we have to look to the Overseas trade for possibilities of expansion. We have sought for new outlets, to a large extent successfully, and we are continuing and shall continue to seek them. India is passing through a period of financial stringency, which militates against us for the moment, but that is a passing phase, and I have no doubt as to the ultimate world-wide success of such a first-class and cheap commodity as the coal product of the Middelburg district.

Other Assets.

Satisfactory progress is being made with the shafts which are being sunk by gold mining companies in the neighbourhood of your Springs property which must ultimately prove of considerable value. In particular I may mention that the shaft on the Daggafontein Company's Estate, which is conterminous with your Springs property, is now down 3.100 feet. It is estimated that the main reef should be encountered in this shaft at a further 400 feet in depth, and that this, at the present rate of sinking, will be accomplished in about four months from now. Turning to the accounts you will perceive that the unappropriated balance of profit carried to the balance sheet is £30.609 13s. 7d., while the cash assets totalled £34,082

5s. 8d., out of which we have had to provide for the dividend £10.000 and also to pay for the equipment of the new shaft and its adjuncts as the various items fell due for settlement. When the new equipment has been finally completed its cost will be definitely determined, and the necessary provisions made in the books by transfer from the appropriation account. In other words, as I have told you, the cost of the new work is being mainly defrayed out of your profits, and that is the reason why we carry forward such a large sum pending the time when we shall know the ultimate cost. Up to now we have naturally had to depend on estimates, but I must at the same time compliment the skill and ability of our manager, Mr. Barlow, the consulting engineer, Mr. S. C. Thomson, and his assistants, on the very close approximations they have made to the actual figures in the instances we have been able to determine. And I must further say that your thanks are due to Mr. Barlow and his staff for the manner in which they have handled the problems of the past year, problems which called for a high degree of skill, tact and virility.

In spite of the fact that the world is full of turmoil and trouble, we look forward to the future with hope and confidence. We are thoroughly well equipped, we have an established and expanding trade, and we have no debt.

The report and statement of accounts were adopted unanimously.

VEREENIGING ESTATES.

Activities Reviewed.

The fifteenth ordinary general meeting of the Vereeniging Estates, Ltd., was held in the board-room, Lewis and Marks Buildings, this week. Mr. Emrys Evans presiding. Among those present were Messrs. G. D. Massey, Louis Marks, G. Falcke, L. H Lavenstein, R. W Townsend and William Mallinson (secretary), representing 440,052 shares out of an issued capital of 730,530.

The Chairman's Speech.

The Chairman, in moving the adoption of the reports and accounts said: The report of your directors and the audited statements of the accounts for the year ended 30th September, 1913, and for the quarter ended 31st December, 1913, are placed on the table and I propose they be taken as read. As has already been explained in the directors' report it was found to be inconvenient to hold the company's annual meeting during the latter part of the year which was necessary if the accounts were made up to the 30th of September. Your directors, therefore, by virtue of the powers conferred on them in the Articles of Association decided that the company's financial year should terminate on the 31st of December. The accounts have, therefore, been made up to the 30th of September, and also to the 31st of December, 1913, and, in future, the annual meetings will be held during the first three months in the year. Dealing with the accounts for the year ended 30th of September, 1913, you will notice that the gross departmental profits shown in the profit and loss account amount to £50,561 17s. 5d., an increase of £34,102 15s. over the corresponding period of 1912. This large and satisfactory increment is due mainly to the increase in the coal mining profits of £16,000 8s. 11d., an increase in the farming profits of £4.101 5s. 7d., an amount of £9.421 2s. 2d., received for interest and dividends, and £4,129 12s., "profit on sales of erven." I must, however, explain that only £1,898 11s. 11d. of the "profit on sales of erven" was actually earned during the year the balance having accrued during the previous year.

Profits Maintained.

Though the departments show such a marked increase in profits due to larger coal outputs and wider farming operations, it will be seen on reference to the other side of the profits and loss account that the expenditure is increased by only £1,375 17s. 9d., and, with the exception of the item "interest," which was increased by £3,424 10s. 1d., the remaining items of expenditure are actually decreased by £2,048 12s. 4d. This is mainly due to the disappearanceof the item "business management" in consequence of the work now being done at Vereeniging instead of Johannesburg as formerly. It is, of course, not possible to make more than a proportional comparison between the profits for the quarter ended the 1st of December, 1913, and those for the year ended the 30th of September, 1913, but at the same time the result of the quarter's working indicates that the profits are being maintained, in fact the profits on coal winning are being steadily and continually increased, while the profits on farming may be regarded as satisfactory. They cannot, however, be taken as a criterion of yearly profits, inasmuch as it is not during the last quarter of the year that the main profits on farming operations are earned. A further accrued profit, but not yet realised, viz., the dividend on 150,000 Victoria Falls and Transvaal Power Company, Limited, cumulative preference shares, which amounted to £15,750, less tax, at the 30th of September, 1913, would have still further increased the profits for the year had it been received. Of this amount £2,250 was received during the quarter ended the 31st of December, 1913, and the balance due to the company at that date stood at £13,500, less tax. The principal items of expenditure in the profit and loss account for the quarter to the 31st of December, 1913, are approximately the same in proportion as for the year ended the 30th of September, 1913. The result of the fifteen months' working has been a net profit of £19,697 11s. 8d., which has reduced the debit profit and loss balance from £115,814 11s. 5d. at the 30th of September, 1912, to £96,116 19s. 9d. at the 31st of December. 1913. A departure in the form of the report has to be recorded inasmuch as on this occasion the directors have deemed it desirable to put in full the annual reports on the year's working furnished by the general manager, the forester and the estate manager.

Sales of Coal.

From the general manager's report you will notice that the sales of coal for the year to the 30th of September last totalled 323,637 tons, a substantial increase over those of the preceding year; while the working costs showed a gratifying reduction. The general manager estimates that the sales for the current year will be 400,000 tons, produced at an improved figure of cost. In a subsequent report to the directors the general manager advised that the total sales for the quarter ended the 31st of December reached the figure of 94,844 tons, an advance of 17 per cent. on the average of the preceding year, and the working costs were decreased. The sales for January and February of this year were 35,433 tons and 32,269 tons respectively, and a further reduction was effected in the working costs. The machinery and plant are in good condition and additions have been made to them with a view to effecting the greatest economy possible. The pumping plants have been considerably augmented, and are sufficient to deal effectively with the large quantity of water made in the deeper workings. Arrangements have been made to take electric current from the Vereeniging Power Station to increase the supply of power to the colliery. The coal continues to give entire satisfaction to the Victoria Falls and Transvaal Power Company, Limited, and other customers. Under the latter category is the Union Steel Corporation of South Africa, Ltd., whose smelting and re-heating furnaces require the generation of great heat. I am pleased to say that after preliminary experiments the corporation finds it could use our coal exclusively for all its purposes. During the period under review two shafts on the north bank of the Vaal River, the sinking of which was foreshadowed in my last address, were completed and driving is proceeding in the direction of the Maccauvlei coalfield. The rock encountered was of a very hard nature; but the drive has made very satisfactory progress, and at the end of the year had been carried in the dwyka conglomerate, a distance of 616 feet. For the month of January the footage was 287 feet and for February 237 feet, and the general manager expresses the opinion that it is almost certain the tunnel will pass through the dwyka conglomerate into coals and shale almost immediately. Unfortunately, the coal seam so far encountered has proved to be much contorted, and a commercially workable area has not yet been located north of the Vaal River. The primary object of the management is to open up the huge area of coal known as the Maccauvlei field, and to cheapen the cost of same to customers by the avoidance of the excessive haulage charges from Viljoen's Drift to Vereeniging by rail. This colliery is provided with a fine modern equipment. Fortunately the strikes which occurred in July and January did not cause any serious dislocation of work. The company's workmen remained staunch during the July disturbances, though some of them ceased work during January.

Farming Operations.

Despite the severity of the drought last season it is gratifying to record a very satisfactory increase in the produce resulting from farming operations. We have experienced a series of lean farming years during which our profits have steadily advanced, and, giving a normal rainfall, this branch of activity will undoubtedly materially increase the revenue of your company. As previously remarked, the profits on farming shown for the quarter ended the 31st of December last are proportionately less than during the year ended the 30th of September. This is explained by the fact that the crops of mealies and Kaffir corn are reaped in the month of June, and are disposed of during subsequent months, so that there is very little on hand for the market at the end of the year. The profit shown for the quarter mentioned is the result, almost entirely, of the disposal of wool. The cattle, which now number over twelve hundred, weathered the drought well and are in good condition. Owing to the introduction of imported bulls, the young stock show marked improvement in strain, and this branch is capable of extension in view of the excellent grazing over practically the whole estate.

Large increases have taken place in the flock of merino sheep, which continues to improve by reason of the annual importation of high class rams. A flock of pure bred Shropshire sheep has been established with a view to providing slaughter sheep for the market. In the past the fattening of sheep has proved lucrative and owing to the distance of the estate from Johannesburg—where there is a growing demand for prime sheep—being so short, there is no loss in the condition of the sheep on arrival, which is a distinct advantage. There are good stands of winter crops for fattening purposes.

Maccauvlei.

The figure by which the value of the plantations has been increased during the year is less than the cost of maintenance and extension of forests by the sum of £542 14s. 8d., credited to the account for timber derived in the process of thinning out and supplied to the company's mines and estates, so that the policy of not writing up the value of the forests has been more than maintained. The report of the manager of this department deals with the various classes of timber comprised in the plantations. Owing to the drought the trees did not make the same progress of growth as during the normal year; but it is satisfactory to note that they did not suffer.

Brick and Tile Company, Ltd.

Steady progress was maintained at the brick and tile works. During the year the Vereeniging Municipality disposed of a large number of stands in the township subject to the condition that buildings were to be erected thereon within two years from the date of purchase. This naturally had the effect of bringing orders to the company for bricks. Large quantities of bricks were also supplied to the collieries for lining the new shafts, erecting buildings and new compounds, in addition to which purchases to the value of £10,000 were made by the Municipalities of Johannesburg and Pretoria, who insist on a high standard of excellence.

Vereeniging Township.

The township is growing at a rapid pace, and, as will be observed from the report, seventy-three buildings have been erected during the period under review. The rateable value is £340,000. The population to-day exceeds one thousand Europeans. In order to cope with the increasing requirements of the town it has been found necessary to considerably augment the present water supply both for household consumption and the numerous industries established, and to enable the Municipality to carry out this and other important improvements, including the building of an up-to-date abattoir, the consent of the Administrator had been obtained to the raising of a loan of £10,000. In conclusion I should like to record the board's appreciation of the services rendered to the company by the general manager, the various heads of departments and the members of the staff, who have assiduously worked in the interest of the company especially during the difficult periods of industrial unrest.

The report and accounts were adopted.

Messrs. J. Emrys Evans and E. S. Marcus were re-elected directors.

Messrs. Alex. Aiken and Carter were reappointed auditors.

YORK G.M. CO.

Annual General Meeting.

The annual meeting of the York Gold Mining Syndicate was held in the board-room, Jeppe Arcade last week. Mr. J. H. Ryan presided, and those present were Messrs. A. Barker, W. H. Dawe, W. H. B. Frank B. W. Hind and B. Southwell. In all 37,000 shares out of an issued total of 37,000 were represented personally and by proxy.

The Chairman's Speech.

In moving the adoption of the report the chairman said: In submitting the reports and accounts of this company for the year ending the 31st of December last, there is little for me to add to the exhaustive details supplied by the manager's and engineer's report on the mining operations, and the directors' report and accounts on the financial side of the company's work. From the manager's report it will be noticed that during the year we mined 89,847 tons against 92,549 tons in 1912, and that out of this we sorted 20,034 tons, or 22.3 per cent as waste, leaving the net quantity put through the mill as 69,813 tons. This rock with accumulated slimes yielded together 23,118 ounces of gold of a value of £97,519 13s. 10d., which, after deducting £82,801 12s. 6d. for working costs, left us with a profit of £14,718 2s. 4d. on the actual mining operations for the year, and a net revenue of £15,012 19s. 8d. after taking credit for some small items of rebates and interest, and deducting two amounts for profits tax under-estimated in 1912, and insurance. The appropriation account shows this £15,012 19s. 8d. to credit, which, with the balance of £21,263, brought forward at December, 1912, gives a total credit of £36,276 7s. 4d., which has been dealt with as follows: Dividends No. 10 and 11 absorbing £11,100; profits' tax, 1913, £1,500; balance to balance sheet, £23,676 7s. 4d. On reference to the accounts you will notice that at the end of December you cash liabilities on account of sundry creditors, bank overdraft, and profits taxed, stood at £5,352, while your cash credits in liquid assets, such as livestock, stores, cash and gold in transit amounted to £5,940 15s. 10d., so that you were practically square. From the manager's report it will be seen that at December 1912, it was estimated we had a reserve of 27,548 tons of developed ore, valued at 5.4dwt., and that it was estimated the undeveloped ground on main and south reefs contained 88,564 tons, and had all our expectations been realised to the utmost we should have had 116,142 tons to work on, instead of which notwithstanding the fact that 2,171 feet of driving was done to get at every payable point we had only extracted 89,847 tons (including 10,926 tons from the Lancaster West pillar) when it was found unprofitable to continue further mining work, and accordingly on the 27th of November last, the mining on this property ceased. All hands excepting those necessary for the dismantling of the mine and the working off of accumulated slimes were discharged and expenses cut down to the lowest limit. Since the beginning of the year we have earned fair profits of a few hundred per month on our slimes treatment, and it is estimated by our engineers that there are sufficient slimes to keep our works employed till July next. As this is possibly the last ordinary general meeting which shareholders will be asked to attend, I think it would be interesting to recapitulate the history of this company's operations from its inception up to date. The company was floated in January, 1907, and started milling in August of that year, since when it has run continuously except for the usual small stoppages incidental to mining, and during this period it has earned a profit of £76,224 4s. 7d., which has been disposed of as follows: Dividends, 130 per cent., £48,100; advances repaid, £13,578; new climes plant supplied, £9,488; profits' tax, £3,137; sundries balance, £1,921 4s. 7d.; total, £76,224 4s. 7d. Besides this we hope to receive a few thousand pounds as profit on slimes for six months of this year, and from £2,500 to £3,000 as the break-up value of the plant, and if our expectations be realised it will mean a further distribution of about 12½ per cent. This I think you will admit is a very creditable performance and redounds to the credit of the engineers, manager and staffs who have worked so loyally and so well in the interests of the company during its entire career and to these men your thanks are due. The report and statement of accounts were adopted.

Mr. Jeppe said that the management deserved credit for the very satisfactory position revealed by the report. He would like to express their appreciation of the efforts of the chairman during the time he had conducted the affairs of the company.

The retiring directors, Messrs. A. G. Gill, Julius Jeppe and B. Southwell, were re-elected, and the retiring auditor, Mr. F. W. Diamond, was reappointed.

New Patents.

55. James Miners Holman and John Leonard Holman.—Improvements in coal cutter mountings.
56. Arthur Joseph Leguin Fisher, William Wilson Lawrie and Thomas Herbert Bayldon.—Improvements in connection with feeding water to hollow rock drills and the like.
57. Tom Wrathall.—Self-coupling trucks.
58. Alfred Rutter.—Process of sterilising milk, cream beverages and other alimentary substances.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

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Empire—Varieties	8.15
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Carlton	7 to 11.15
Orpheum	7 to 11.15
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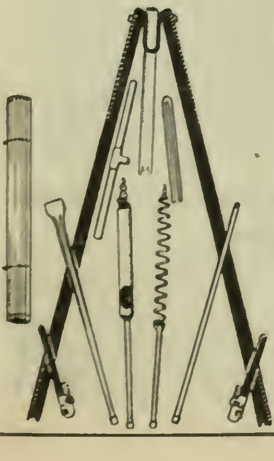

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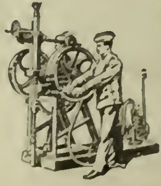

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CONTENTS.

PAGE

Notes and News 149

Topics of the Week:

Rand Unification—Pros. and Cons. 151

Labour Registries for the Rand 152

Progress on the Further East Rand 153

Oil Shale Mining—II. 154

Joint Staff of the Consolidated Main Reef Mines and Estate, Ltd., and Main Reef West, Ltd. 155

Wholesale Mining and Milling 156

The Crown Mines Report 157

The World's Three Leading Gold Mines 158

The Evils of the Present System of Native Recruiting 159

Hygienic Aspects of the Mining Industry 160

The Position at the Bantjes 161

The Year with the Durban Roodepoort Deep 161

The Village Deep's Satisfactory Annual Report 162

Position and Prospects of the Modder B. 162

"T.C.L." Prospecting and Mining in 1913 163

The Year with the Groenfontein Tin Mine 164

The Unification of the Rand Mining Industry 165

Position and Progress of the Sheba 167

Correspondence and Discussion: "The Shortcomings of the Prospector in South Africa" 167

Rhodesian Section:

Latest Mining News 168

Machinery and Motor Cars at the Agricultural Show ... 169

Details of the March Output 170

The Week in the Sharemarket 173

Engineering Notes and News 175

Accident Prevention at an American Mine 176

Finance, Commerce and Industries 177

Grade, Costs and Profits in February 179

Notes and News.

The Voorspoed Inquiry. During this week at any rate, the New Law Courts could claim to be the hub of the mining world of the Union. In addition to the presence of the Minister of Mines, at the Department of Mines in the building, the Dominions Commission, for a portion of the week, was busy hard by in collecting evidence on vital aspects of the industry. In the neighbouring court, Mr. Justice Ward sat all the week trying the *cause celebre* between the Consolidated Langlaagte and the Victoria Falls Power Co., drawing big houses of mining experts. In another wing of the building the Board appointed to investigate the closing of the Voorspoed by De Beers, drew a big gathering of Kimberley mining men. Amongst these last was Mr. Oppenheimer, representing the Diamond Syndicate, and Mr. Williams, the General Manager of De Beers. The evidence given before the Dominions Commission is dealt with in this issue, and we shall have something to say about the Consolidated Langlaagte and Voorspoed cases next week.

* * * *

The Backveld and Amalgamation. In the House of Assembly this week, Mr. Grobler, the member for Rustenburg, gave notice to ask the Minister of Mines a question in which it was alleged that Mr. R. W. Schumacher, the Chairman of the Rand Mines, Ltd., was in favour of amalgamation of the mines. Mr. Grobler's reference to Mr. Schumacher is, of course, most misleading, the whole tendency of his evidence, both in written statement and oral examination, being adverse from the idea of a general amalgamation of the gold mines, which was not desired by the Rand Mines, Ltd., and which in any case appeared to be impracticeable. The misunderstanding as to the nature of Mr. Schumacher's evidence must have arisen through the necessarily abbreviated summary that was telegraphed to Capetown. In the circumstances, Mr. Grobler's question has no point as far as Mr. Schumacher is concerned.

* * * *

Mr. Merriman and the Colour Bar. In the Assembly on Tuesday last Mr. Merriman presented a petition signed by 1,640 residents in the Transvaal, praying that the mines regulations with regard to coloured persons should be altered. This is doubtless the petition recently extensively signed by coloured people on the Rand. Its fate will be watched with interest.

* * * *

Dust Prevention on the Mines. The Mines Department informs us that the work of sampling the dust in the mines of the Rand has now been completed and that it is likely that at an early date the Miners' Phthisis Prevention Committee will issue a report on the subject. The work has been going on since December, but was naturally interrupted by the strike in January.

* * * *

Inquiry into Natal Resources. A resolution of much interest and importance has been drawn up by Mr. Gundelfinger for submission to the Natal Provincial Council. It is in these terms: "That this Council respectfully asks His Honour the Administrator to appoint a Commission to inquire into the best means of further developing the agricultural, mining, and industrial resources of the Province, with power to take evidence and call for papers." It may be a debateable question whether the appointment of a Commission to undertake the task described is not a matter for consideration of the Union Government, rather than of the Provincial Executive.

* * * *

High Grade Ore at the Birthday. We understand that high grade returns are now being secured by the tributors operating the old Birthday Mine in the Klein Letaba District. The preliminary crushing is said to have yielded an ounce to the ton, and it is probable that this return will encourage the workers to attempt further development. Altogether there is much activity to be observed at the present moment in this district, which about twenty years ago was one of the leading gold mining districts of the Transvaal.

* * * *

The Bell Reef Crushing.

Yet another name will soon have to be added to the list of the new and larger regular producing mines of Southern Rhodesia. This is the Bell Reef Development Company, under the control of the Gold Fields Rhodesian Development Company, and which officially commenced milling a few weeks ago. For the past month the full tonnage has not, of course, been milled, but the company should make a substantial declaration to the output of the country at an early date. This property is situated in the Gwelo District of Matabeleland, and has been equipped with an "all roasting" plant of 4,000 tons per month capacity. The estimated ore reserves at September 30th last were 42,495 tons of an average assay value of 12 dwts. This tonnage lies between the 4th and 6th levels, and development is now in progress on the 6th and 8th levels.

* * * *

Drill-Sharpening Practice on the Rand.

Even the smaller economics, when reflected over the enormous tonnage handled by the mines of the Rand, mean large aggregate savings, and one direction in which investigation appears to be called for with a view to the reduction of costs is in regard to the sharpening of drill bits. The greater part of this work on the Witwatersrand is now performed by machines, and the saving, through the employment of mechanical appliances, as against hand-sharpening, is very large. From a reliable authority we understand that economy to the extent of something like 39s. per 1,000 steels handled results from drill sharpening by mechanical appliances, as against sharpening by hand. We learn that to-day about 80 per cent. of the bits employed in Main Reef mines are sharpened by hand, and this naturally leads up to an inquiry as to why all mines do not adopt the obviously more economical method. In other words, if eighth-tenths of the Rand's technical talent is of the opinion that the sharpening of drill bits by machine is more economical than by hand, what reasons can the adherents to the more antiquated method adduce for their conservatism? This consideration in turn leads us on to consider just one of the benefits that unification of the Rand would result in. Under one control, such an unbusinesslike state of affairs as that disclosed in regard to drill-sharpening practice would be out of the question, for if it were decided that a certain practice were the best, it would, under a system of unification, be universally adopted.

* * * *

The Afrikander Reconstruction.

Doubtless the scheme proposed for the reorganisation of the Afrikander's finances is the best that could be devised. At the 31st December last the company owed, principally to the African Banking Corporation, £33,194, and the bank is now pressing for repayment. By putting up additional funds shareholders simply pay their debts, and out of £44,800 to be raised only about £5,000 will remain, which means that the directors must approach the shareholders again—or the public—before operations can be resumed. Holders of every 100 shares are to be given 16 new shares, which is certainly drastic pruning.

* * * *

Life of the Premier Mine.

Giving evidence before the Dominions Royal Commission last week, Mr. Ross Frames, managing director of the Premier Mine, said £900,000 had been paid in preference dividends and £1,400,000 in ordinary dividends. The expenditure on equipment had totalled £1,821,065. The output to October last was 16,155,704 carats, value £14,960,001, and the life of the mine for practical purposes was eternity. Ten million tons of ground removed last year only lowered the mine 33 feet. Government had received £403,550 in 1912, and £507,614 in 1913. As to the 60 per cent. of profits, he said he would be favourable to a combination for the sale of diamonds, if there were a complete monopoly, that meaning a combination of the great producers, so that the market could be controlled. He gave the average white man's wages as £24 19s. 7d. monthly, excluding staff, and the number of hours per shift as 10. For the year ended last October white employees had received £261,816 as wages. He complained that the proceeds of the ½ per cent. export duty on diamonds was not used for the purpose of suppressing the illicit dealer, as it was supposed to.

* * * *

A Remarkable Testimony to Tube Mills.

Seldom has the case for the tube mill been expressed more convincingly than in the technical reports of the New Primrose Company for last year. This fine old mine, although it has yet many thousands of pounds to distribute in dividends amongst shareholders, is not a mine possessed of a very long life, and when some little while ago it was announced that the plant was to be increased by the tube mills and classifying cones there might have been some who were sceptical as to the wisdom of spending £10,000 on these extensions of plant. The New Primrose last year, however, showed convincingly that the initiation of a fine grinding policy late in the mine's life was excellent business, for already the cost of the plant has been more than paid for through improved recovery, and the new mills will continue to benefit the mine's returns until the curtain is rung down on its prosperous career. In point of fact the employment of tube mills last year at the New Primrose meant an actual cash profit to the company of £10,644. The total average residue was reduced from ·559 dwt. to ·248 dwt. and the total extraction improved from 92·164 per cent. to 96·7 per cent., so that last year not only was the £10,000 spent on the new plant recouped but in addition a profit of £644 over and above the capital outlay was earned.

* * * *

The Outlook for Zinc.

The prospect of the Zeerust zinc mines soon coming to the productive stage lends interest to the position of the zinc industry. The history of the zinc industry for 1913 is not pleasant writing, and while the rôle of Cassandra has ever been a thankless one, it does not need the prevision of a Cassandra to predict a lean period for the ore producer in 1914. The year started with a smelting capacity active in the United States of about 1,000 tons per day, and the figures published at midyear by the U.S. Geological Survey showed 180,000 tons produced. As there has been no appreciable decline in production since that time, it is probable that the total production for the year will be in the neighbourhood of 350,000 tons as against a production from all sources in 1912 of 338,806 tons. But the stocks of metal on hand during the first half of the year had enormously increased, and it is probable that the stock remaining in the hands of the producers alone on December 31, 1913, will be well in advance of 50,000 tons, indicating a consumption of somewhere in the neighbourhood of 300,000 tons, as against 340,341 in 1912. At this moment it is impossible to give these figures with any degree of accuracy. There have been no advances in the metallurgy of zinc in 1913 as relates to the practical operation of smelting works unless an enforced economy can be considered an advance. Much experimenting was done in electro-thermal smelting, and one experimenter has recently announced his intention of carrying on his work to a commercial basis in the near future. Work carried out by others gives promise of commercial results in the future, but up to to-day the amount of data published by anyone is insufficient on which to base commercial calculations. The fact that the metal fetches some £10 per ton more in South Africa than in Europe must, however, be considered.

* * * *

Kolmanskop.

The Kolmanskop people seem to have a good grievance against the German limit on their production. At the meeting in Capetown last week, the Chairman, Mr. Ginsberg, expressed the opinion that the present taxation was excessively high. Out of the aggregate profits Government took 60 per cent. in taxes and selling commission, leaving 40 per cent. to the company. Mr. Ginsberg then dealt with the decision of the German Colonial Office to restrict the output of diamonds in German South-West Africa. The quantity apportioned to the Kolmanskop Company was 89,000 carats, which is below the output of 1913, itself low owing to heavy rains and labour shortage. He felt this step taken by the Colonial Office to be most unwise, for the reports for 1913 of diamond companies within the Union of South Africa showed continued considerable expansion and increased prosperity, and the outlook as to the prospective demand seemed disinctly satisfactory. He quoted the increased output of the Premier and the optimism with regard to the demand shown at the De Beers last annual meeting. Such considerations made it impossible to understand the principle which guided the German Colonial Office in deciding to limit the output for sale unless they had made arrangements that all producers of diamonds, including De Beers and the Premier Company, should restrict their output in the same ratio as the producers in German South-West Africa. Every effort was being made to get a reversal of the new arrangements. In conclusion he saw no reason why the prosperity the company had enjoyed during the past five years should not be continued, provided that Government would allow them to work out their own salvation. The output, which was at its lowest in December, that is, at 6,377 carats, had been, for the first months of 1914, 7,004 carats, 6,167 carats, and from March 1 to 20, 6,683 carats.

* * * *

An Ehrlich-Hamilton Fusion.

Particulars have been published of the interesting project in connection with two important companies controlled by Messrs. L. Ehrlich & Co.—the H. E. Proprietary, Ltd., and the New Districts Development Company, Ltd. As the directors state in their circular, a number of options and claims belonging to the H. E. company were abandoned some years ago with the object of minimising the amount payable in respect of licences, and only the most promising claims have been retained. In all, over four-fifths of the original area has been abandoned, and the figure at which the company's properties stand in the balance sheet has therefore ceased to bear a proper relation to their actual value. The result of the exploratory work at depth on the Murchison Range has been disappointing, despite favourable results over small areas. While it cannot be definitely stated that the company's properties are unpayable, and a promising field for individual miners has been shown to exist, the conclusion at which the directors have arrived is in accordance with the report of the Mines Department of the South African Government, which states that "Owing to the very uncertain nature of the lenticular and other reefs, the patchy and erratic distribution of pay values, and the inherent geological difficulties of prospecting, there is not much room along the Murchison Range for larger enterprises planned on a more ambitious scale." For the last three years H. E. Proprietary has been "marking time," work having been suspended and expenses reduced to a minimum. The effect of this policy is seen in the fact that the company has about £43,000 of comparatively liquid assets. Included in this amount, however, is a loan to the New Lisbon Berlyn Co. of £16,000, which together with a similar advance made by the New Districts Development Co. is entitled to rank as a first charge upon the whole property of the Lisbon Berlyn Co. including its freehold farms. It is pointed out that in the event of the liquidation of H. E. Proprietary an eventual distribution of about 2s. 6d. per share would be possible after the loan referred to had been paid off. The directors do not, however, consider liquidation to be in the best interests of shareholders, involving, as it would, a considerable delay and the virtual abandonment of assets, which have a prospective though indefinable value. The alternative of amalgamation with the New Districts Development Company, which has joint interests with H. E. Proprietary in the New Lisbon Berlyn, the Magato Concession and other minor assets, has been considered and a basis agreed upon.

TOPICS OF THE WEEK.

RAND UNIFICATION—PROS AND CONS.

The Dominions Royal Commission has rendered a signal service to South Africa by turning men's thoughts to the possibilities inherent in the proposition to unify or amalgamate all the mines of the Rand. An important, if not the only, function of the Commission is to consider the development and conservation of the natural resources of the Empire, and, naturally, they were impressed by the lessons afforded at Kimberley of an industry concentrated to resist disintegrating factors, the most notable of which, as all the world knows, was the competition of producers in a variable and unstable market. Coming fresh to the scene, the Commissioners were surprised to find that a centre of industry, where of all others the severest and most cut-throat competition might have been expected both in the spheres of marketting of produce and supply of labour, was a placid, well-ordered community, tranquilly working out its industrial salvation. The secret, of course, was seen to lie in the genius of Rhodes manifesting itself in the unification of the diamond mines for purposes of production and disposal of produce. From that picture of idyllic contentment and peaceful prosperity the Commissioners were thereupon transported to the contemplation at close quarters of the bewildering maelstrom of the Rand. Here, it is not too much to say, they found everything at sixes and sevens. White labour alarmed and resentful, lending a ready ear to the wildest outbursts of imported demagogues; black labour discontented and discouraged, where not distracted by a multiplicity of counsels; investors and the sharemarket disappointed and suspicious; the business community depressed and despondent; and the big employers engaged in an unedifying scramble for native labour—these things combined to present the Commission with a puzzling and disturbing picture of industry. Very naturally, the first question asked was, why the Rand could not imitate Kimberley; and as the evidence unfolded day by day continued to reveal unsatisfactory conditions the Commissioners grew more insistent with their question. At their request Mr. R. W. Schumacher and Mr. George Nathan prepared—at very short notice—detailed statements in which it may be said the views of practically all the leaders of the mining industry are very faithfully mirrored. In justice to both authorities, we print their statements elsewhere in this issue; and it is not too much to say that no more vitally interesting subject has come yet before the industry for discussion. The daily Press, as we anticipated last week, briefly dismisses the matter as either (1) a visionary "day-dream," or (2) an academic subject for debate, or (3) as detrimental to the commercial activities of the place. These are the views of the *Daily Mail*, the *Star*, and the *Leader* respectively. The Labour Press on the subject, as usual, lapses into whirling words and incoherency. The point which all seem to overlook is that the Dominions Commission, in accordance with its usual plan of issuing interim reports, will doubtless, and unless we are very much mistaken, within a couple of months set Governments, shareholders and everyone else talking by boldly advocating the unification of the Rand in the interests alike of the Union, the Empire, and the far-scattered investors. For this reason, if none other, it behoves us seriously to take stock of the proposition in all its bearings.

Not that reasons are wanting for dealing with the idea on its merits. Most of us may be too close to the industry to see its greater possibilities with the same ease and clearness as the newcomer, but we can all enumerate, with Mr. Nathan, its minor failings and the shortcomings of the present group system. Mr. Nathan, it is true, makes out a sufficiently formidable list of objections, and he has by no means exhausted the list. To us the most noteworthy to-day is the unequal efficiency of the native on different mines, and the evils resulting from the lack of consistent, uniform, and most economical handling of the available native labour force. The figures quoted by Mr. Schumacher, as supplied to him by Mr. Warriner, are so striking a testimony to the use of machine drills that we cannot understand how other mines can justify the continued pursuit of a different policy.

Certainly in the armoury of the advocate of unification we know of no stronger weapon than this of the most economical utilization of the native labour supply. Were the efficiency obtained from the natives by some mines to-day to be secured by all, the effect on profits and on the crushing capacity of the Rand would be considerably enlarged. To obtain that highest level of efficiency throughout the Rand, combined with all possible benefits from joint recruiting, the advocates of a general amalgamation hold that theirs is the only way. Indeed, some of them estimate that 40 per cent. more ore could be crushed and the present total profits nearly doubled by the adoption of their proposal. As corollaries, they claim a vast extension of the life of the Rand, a doubling of the revenue, direct and indirect, now accruing to the Government, and a great expansion in trade and commerce consequent on the increased spending capacity of the whole industrial community in mine stores and wages to white and coloured. This aspect of the question almost obviates the necessity of Mr. Nathan's proviso to retain a quarter of the profits for local investment after a seven per cent. dividend had been paid. Of other advantages claimed for the proposal to unify the Rand, the more noteworthy are the stability thereby secured for the white employee, and the economies resulting from the concentration of crushing operations on a large scale. The first-named certainly offers great prospects of increased white efficiency, and the second promises to realize all the economies that are attendant on operations conducted in a wholesale way and that have never yet failed ultimately to result from Rand amalgamations when those amalgamations have been of the real and not of the merely " paper " description.

So much for the benefits derivable from change. The arguments against it, as enumerated by Mr. Schumacher, are not less impressive. In his opinion, as shown by his printed statement, all the main advantages that are claimed for amalgamation can be obtained without it. The greatest of these benefits he holds, to wit, a combination of the employers in the sphere of native labour recruiting, has already practically been achieved, and only the finishing touches remain to be put to that great union of effort. The same is true of the other advantages held out by a single administration. The increased use of rock drills to supplant native labour—a reform from which he expects great things—is, after all, independent of any big amalgamation scheme. Moreover, the stability of the white workmen on the mines, he inclines to think, may be equally as well secured by a central employers' labour registry, and a determined effort by all concerned to ameliorate present conditions in this respect. Again, the economies resulting from the conduct of operations on a large scale are, he thinks, covered by the existing genuine—as opposed to " paper "—amalgamations such as that of the Crown Mines, and he does not despair of seeing other similar important aggregations of industry on the Rand, enjoying all the benefits of the major proposal while retaining the division of the field into large units. His contention, in a word, is that the rejection of the unification idea in no way excludes the realization of economies from an increased measure of combination on the part of employers—short of actual union—in all the main directions in which unification could possibly operate. It is noteworthy that he does not say there will be no more amalgamations; he merely thinks there will be none in the immediate future. Plainly also, he admits that the small mines and groups could only benefit by a great amalgamation—he is merely doubtful of the benefits to the larger groups, which would, of course, have to buy out the smaller. In fine, Mr. Schumacher is all for advancing rapidly—but on safe lines. He has no faith in reforms that necessitate gigantic industrial upheavals. With qualifications, he favours President Wilson's dictum that " the large thing is the right thing "; and no one, after all, is in a better position than he is to decide the question. Indeed, the fact that Mr. Schumacher, speaking as Chairman of Rand Mines, Ltd., and for the Central Mining group, representing 49 per cent. of the dividend-paying enterprise of the Rand, has flatly declared against it relegates the idea finally for our time to the realm of the impracticable. Whether the Dominions Commission will adduce any new general arguments to bear on the matter; whether even they will attempt to voice their known views and to prescribe any definite policy for the Rand to follow, remain to be seen. At any rate they have set men's minds on an extraordinarily interesting and fascinating theme, fraught with far-reaching possibilities.

A MINE EMPLOYERS' REGISTRY.

However impracticable the idea of unifying the mines of the whole Rand may be, there are certain obvious and easy steps in that direction that may conceivably be adopted with profit to the industry. In the evidence given before recent Commissions a great deal was said about the establishment of central labour exchanges, but, to our mind, no witness really put the case properly for one central employers' registry. Private and Government registries here have been failures, and no undertaking of the sort can hope to succeed without the co-operation of the mines. The registry lately started by the East Rand Proprietary Mines alone has been a success, and the idea obviously can be extended with advantage to embrace the whole Rand. In this matter Germany furnishes us with the most apposite lessons. The industries which have most largely adopted this method of obtaining labour are the colliery, metal and machine, building, and transport industries; but there are also many employers' registries in connection with the textile, clothing, and wood industries. In several localised industries the employers refuse on any condition to engage work-people except through their recognised registry. The miners of the Ruhr district, for example, are required without exception to engage themselves at the Essen central registry for the colliery industry or one of its branches. The contentions of the employers in establishing their own registries are perfectly straightforward and theoretically sound. The object of a labour registry from their standpoint, they say, is not to find work for unemployed workmen indiscriminately, but to find workmen for the precise work that waits to be done. No employer engages workmen simply in order to relieve a congested labour market; on the contrary, every man engaged is needed to fill a special vacancy and to discharge a special function; if the position and the function did not exist he would not be employed. But the desire to obtain efficient labour and to obtain it speedily is not the employer's only purpose in establishing his own registry and he does not pretend that it is. A second and an equally important object is to keep out the restless elements in the labour force and to fortify the position of capital in the contingency of disputes. As one of the speakers at a recent conference of employers' federations held at Wiesbaden said:—" Our labour registries are naturally in a certain sense militant organisations. We have openly acknowledged that and we say it without fear. Our employers' federations have been formed not for the purpose of retaining the workers, but as a weapon wherewith to resist their ever-increasing demands and the ever-increasing power of their organisations. And just as the federations have a defensive and a militant purpose, so it is obvious that the employers' labour registry must subserve the same end. From this standpoint it is the purpose of the labour registry to offer the employers efficient help in the event of strikes and lock-outs." This supplementary purpose is achieved by exercising a more or less inquisitorial control over the workmen who offer themselves, and by making it difficult for disturbers of the peace to obtain employment. Dawson's book, " Industrial Germany," tells us further:—

> An elaborate card system of records of antecedents forms part of the machinery of the employers' registry. Nominally these *dossiers* are intended to afford a ready indication of a man's special capacity, his steadiness and stability, and his general character. Often the record goes further and, without saying it in so many words, affords a clue to his political tendencies, the brand of his trade unionism, and his desirability from the standpoint of internal harmony. It is a common complaint of the trade unions in some towns that active trade unionists are marked men whose chances of re-employment, should they fall out of work, are small. Many a workman who has made himself unpleasantly prominent owing to a too eager and importunate advocacy of trade union principles loses his employment for no known reasons, and would be a wanderer for the rest of his life were it not that some labour organisation finds use for his services, or that he is able to find an independent means of livelihood. If he keeps to his trade and finds employment in another town he will soon find himself discharged on some vague pretext or other, the true reason being that a letter has been received from the employers' association of his trade, marking him as dangerous, and urging that, in the interest of employers generally, he should be sent about his business. It is said that not a few coal miners now settled in Scotland left Westphalia owing to the refusal of the colliery companies to take them back after disputes.

Critics of the proposal on the Rand will, doubtless, point to the reluctance of mine managers to allow any central office to do the choosing of their workmen for them; and will doubtless add that German mine managers have a supply of real miners to pick from, while here we have only amateurs and handymen turned miners. Admitting the force of both these objections, however, it is open to question whether they are insuperable.

PROGRESS ON THE FURTHER EAST RAND.

Fifteen Shillings Working Costs in Sight—Some High Grade Returns—A Field of Immeasurable Possibilities.

It is clear that very considerable scope exists for reduction of working costs in and on the mines of the Further East Rand, and it is generally anticipated that a reduction in operating expenditure on these properties and a corresponding improvement in profits will be one of the most noticeable features of the Rand's statistical progress during the next few months.

Two Salient Features.

In examining figures as to output, working costs and profit earning on the Further East Rand, two outstanding features call for comment. In the first place the grade of ore worked in this area is materially higher than the average for the Witwatersrand as a whole. That this is so, is well evidenced by a reference to the figures relative to recovery per ton of the different mines during February. The yields in dwts. per ton milled were as follows:—Brakpan, 6·26; Geduld, 7·54; Modder B., 8·58; New Kleinfontein, 6·28; New Modderfontein, 9·30; Van Ryn, 6·18; Van Ryn Deep, 7·75. The average for the whole Witwatersrand in the same month was 6·32 dwts. per ton, so that it will be clear the Further East Rand area is substantially richer than the more Central and Western portions. In some quarters the idea is held that the higher yields of the Further East Rand mines is the result of a close selective mining and milling policy, and that as the area in question becomes more extensively operated and the richer zones worked out the grade will fall. The recent history of the Brakpan Mines is pointed to as being confirmatory of this. It is admitted that selective mining and milling have been practised on the Further East Rand and within certain bounds this policy has certainly a great deal to recommend it. Mr. Schumacher, at the Modder B. meeting a year or two ago, made a striking reference to the subject, and it will be readily granted that where very large blocks of ground have to be dealt with by a comparatively small milling installation and where the prospects of reducing costs by a substantial margin in the future are good, too painstaking an endeavour to average the grade may only actually result in loss or at any rate the returns would not be as advantageous as if no set rules and cramped policy were adhered to. The Further East Rand area, like the more Central section of the Main Reef series, contains both rich and poor zones, but perhaps in the field lying to the east of Boksburg the fluctuation is even more noticeable than along other portions of the Main Reef series. However that may be, the field as it is being worked to-day is of higher grade character than the Rand as a whole. The high recoveries of the New Modderfontein and Modder B. last month are particularly noticeable, and it should also be observed that the Van Ryn Deep's return of seven and three-quarter dwts. per ton milled is below the average value of the ore reserves in that mine.

Working Expenses.

The second feature of note calling for remark is that despite the flat nature of the reefs, which is not conducive to cheap shovelling or lashing costs in the stopes, the average working charges of the Further East Rand propositions in February were less than the average for the whole Witwatersrand. The following table exhibits this:—

Mine.	Tons Milled.	Total Working Costs.	Working Costs. a.	b.	c.	Profit per Ton.
Brakpan Mines	45,030	£43,111	16/ 8	2/ 6	19/ 2	7/ 6
Geduld	17,600	21,018	20/ 8	3/ 3	23/11	8/ 1
Modder B. ...	33,100	25,728	14/ 0	1/ 6	15/ 6	20/ 6
New Kleinfntn.	47,300	41,413	16/ 5	1/ 1	17/ 6	8/10
New Modder ...	41,500	34,149	14/11	1/ 6	16/ 5	22/ 8
Van Ryn ...	35,000	27,452	13/ 9	1/11	15/ 8	10/ 9
Van Ryn Deep	34,200	31,391	16/ 4	2/ 0	18/ 4	14/ 7
	253,730	224,262				

Working costs: (a) Working costs per ton milled, exclusive of development; (b) amount spent per ton milled on development or development redemption charges; (c) total working costs per ton milled.

From this table it may be calculated that the seven producing mines of the Further East Rand milled 253,730 tons last month at an expenditure of £224,262, or an average of about 17s. 8d. per ton milled. For 50 companies of the Main Reef series working costs averaged 17s. 11d. per ton, so that the Further East Rand mine worked for 3d. per ton less than the average for the whole of the Main Reef series. It will be noted, too, that in the majority of instances the allowance in respect of development or development redemption charges on the Further East Rand was a liberal one. The costs prevailing to-day must not, however, be regarded as representative of the limit of economic working for the mines in question.

Fifteen Shillings Costs in Sight.

Previous to the strike some of the properties dealt with in the foregoing were operating at a figure materially below what they are being worked for to-day. Five of the seven mines under discussion have idle stamps in their mills. In February 20 of the Brakpan Company's heads were hung up, in the Geduld mill 10 were idle, in the New Kleinfontein 20, in the Van Ryn battery 25, and in the Van Ryn Deep 10. By operating on a larger scale there would, of course, be a tendency to cheaper operation, and it must, moreover, be remembered that at several of these plants—notably the Modder B., New Modder and New Kleinfontein, extensions of equipment are likely to be undertaken in the near future. It must not be forgotten that the newer mines of the Further East Rand have been able to profit from the experiment and learning of the older mines. In fact, into the mines and mills of companies like those of the Van Ryn Deep and Modder B. all the knowledge of two and a half decades of experience has been compressed, and the result is that despite the disadvantage of flat stopes working costs compare more than favourably with the operating charges of other and larger equipped mines. Under more favourable working conditions there can be little doubt that working costs over the whole area would be reduced to about fifteen shillings per ton. It is interesting to note that to-day the working charges, apart from development costs, of the Modder B., New Modder and Van Ryn are below fifteen shillings per ton milled, and it is important to learn that within the next few months the expenses of two or three of the mines noted above are expected to be reduced to fifteen shillings per ton inclusive of development charges.

The Profit Aspect.

These interesting calculations lead us to the question of the profit earnings of these mines. The earning on a per ton basis during February is exhibited in the foregoing table and from this it will be observed that two of the mines—the Modder B. and New Modder—earned over a sovereign per ton. The Van Ryn Deep's 14s. 7d. will certainly be materially increased in the near, if not indeed in the immediate future, for as already stated a higher grade of ore can be sent to the mill without in any way picking the eyes out of the mine, whilst ability to substantially reduce underground expenditure has been demonstrated. It is gratifying to learn in regard to this mine that development in the western section, close to the Benoni boundary, is very satisfactory. We understand that recent exposures in this section of the property have been most encouraging—a fact which augurs well for the New Kleinfontein-Apex-Benoni fusion scheme. A further gratifying piece of information that reaches us is to the effect that development from the south-west shaft of the Modderfontein Government Areas is proving quite satisfactory. With this mine and the Modder Deep Levels to crush at an early date, with extensions to the equipments of existing producers in view, and with such excellent prospects of lower working expenses prevailing throughout the Further East Rand area generally, in the near future the outlook for improved profits from this section of the Witwatersrand gold fields is undeniably good. We are assured that within the next five years the Further East Rand mines will record such progress as in these pessimistic times is scarcely dreamed of.

OIL SHALE MINING.—II.*

A Detailed Discussion of an Industry of Great Potentiality in South Africa from the Investor's Point of View.

[By J. F. KELLOCK BROWN.]

THE following is a continuation of our article of last week:—

MINING.

On the whole, there is but little difference in shale-mining and coal-mining. On general lines, dislocations and faults, and the increase and decrease of thickness in the seams, are more pronounced in the Scottish shale beds than in the Coal Measures; this, however, is likely to be admitted a local condition, using the term as applied to the Lothians as distinct from a shalefield in any other land. Shales are harder to mine, drilling and blasting being heavier and more frequent owing to the toughness and grittiness of the material to be excavated. Fine shale at the same time is objectionable for much the same reason that fine ore is difficult to use in the blast furnace; it is apt to clog the working of the retort, and to be carried away with the vapours, causing more dust in the crude oil. Actual mining is carried on either by the longwall or bord-and-pillar methods, and the conditions which govern the adoption of any particular system are the same as those operating in coal seams—thickness of seam, inclination, roof and pavement, bands of unworkable stone. Machine shale-mining has hardly up to the present been considered a success, although probably this is mainly due to the application of machines designed for coal conditions to those of shale-mining; yet, with a more thorough appreciation of the difficulties, this drawback will be overcome. In other respects, operations in the shalefields commonly follow the practice generally obtaining in the coal areas adjoining the shale deposit. Haulage, winding and ventilation are identical, though in many cases inclined shafts or slopes are the rule rather than the exception. There are no surface operations at the mining end beyond the crushing of the material by roll or jaw crushers to pieces 4 to 5 in. in size. Sometimes the crushing is done at the mine, but more frequently the product of several mines is hauled to crushers situated at the crude oil works. The items responsible for increase in costs over coal-mining in any special region are the increased use of explosives and the decrease in tonnage handled per man, but proper operation and management has much to do with the rise and fall of costs on those two items. In one shale district blasting costs ran to 3½d. per ton, while in an adjoining coal region, where conditions were sufficiently similar to form a basis of comparison, explosives cost ¾d. to the ton. The day's work in the same two regions averaged 2¾ tons per man in the shale. In both cases mining operations were severe. Where these same figures were compared month after month they frequently showed the output per man in both the shale and coal equal. The mining cost in most of the newer operations can be reasonably estimated by basing it on the coal expenses, but outside of this costs vary considerably from district to district, or country to country, being influenced by the wages paid; there is a difference between a standard wage of 8s. and one of 1s. 8d. Depending on these facts, the increase over coal mining may run from nil to 30 per cent., and in actual figures work out, under normal conditions, at a total of 3s. 9d. to 6s. per ton.

CHEMISTRY.

The chemistry of the production of the oil from the shale is almost entirely embraced in a study of the behaviour of the paraffin and olefine series of hydrocarbons under the influence of temperature and pressure. As the oil is not held in the shales in any included or contained form, from which it could be obtained by any leaching or squeezing action, but is present in the carbon elements making up the shales, a process of destructive distillation is used to catch the oil contents. At a certain temperature (800 deg. F.) the hydrocarbons are driven from the shale rock as a vapour, only to reunite in different hydrocarbon combinations that, on being cooled, condense to form oil. The products of the first process are crude oil, ammonia and gas. The gas is scrubbed and washed and used as a fuel; the ammonia unites with the necessary quantity of sulphuric acid and forms the important by-product, sulphate of ammonia. The crude oil is treated in the refinery and goes through a succession of processes of cleaning and distilling, whereby the oil is separated or fractionised into various grades of different specific gravity and of varying qualities. Between each distillation process there is a treatment with an acid and an alkali, which removes impurities in the form of acid and soda tars—used as fuels—and phenols, objectionable because they otherwise tend to cause the oils to turn red and brown. Finally, the end of the series is reached in the form of a heavy distillate that, on being cooled and otherwise treated, forms the white tasteless and odourless paraffin wax largely used in the manufacture of candles. The general routine of the operations or works processes varies, depending partly on the ideas of individual management, and partly on the extent to which the process of refining is carried. Within limits larger percentages of certain oils can be obtained at the expense of others. The general line of one refinery scheme is given as follows:—Crude oil distilled gives (1) naphtha; (2) once-run oil; (3) still coke. (1) Naphtha gives (a) naphtha, sp. gr. 0·730; (b) naphtha, 0·735 sp. gr.; (c) residuum. (2) and (c) distilled together give (A) light oil; (B) burning oil; (C) heavy oil; (D) coke. 3 and D are finished products and sold. B redistilled gives burning oil B, intermediate oil B_2 and soft paraffin B_3. B_2 gives intermediate (0·850) and soft paraffin C_1. B, burning oil, treated with acids and alkalis, gives two finished products, naphtha and burning oils, and an intermediate oil C_2. C_2 and B_1 are redistilled together. C_1 and B_3 together give a heavy oil D_1 and paraffin. The paraffin is sweated and resweated to the finished paraffin grades. D_1 gives finished lubridating and soft paraffin, which goes back to C_1. In its proximate analysis a shale yields: Ash, 70·21 per cent.; volatile matter, 25·30 per cent.; fixed carbon, 4·49 per cent. This shows that 74·70 per cent. of the product mined goes to the spent shale heaps. The volatile matter contains the oil in varying proportions, the following being a reasonable average: Oil, 11·10 per cent.; water, 6·33 per cent.; gas and loss, 7·83 per cent. The percentage production of refined products varies considerably, the results in Table I. being taken from a number of published sources:—

TABLE I.

	Scotland.	Scotland.	South Africa.	Canada.	New South Wales.	France.	Spain.	Russia.	Servia
Crude oil . .	21.70	40.00	35.00	40.00	101.00	40.00	60.00	70.00	45.00
Sulphate of ammonia . . .	70.00	12.00	60.00	76.00	60.00	15.00	25.00	60.00	70.00
Naphtha	0.68	3.36	5.21	1.45	8.48	2.15	0.50	—	5.00
Burning oil ...	30.53	40.59	29.60	11.50	19.50	30.62	11.50	—	26.00
Intermediate oil	1.78	0.70	—	14.60	15.87	—	14.01	—	4.31
Lubricating oil	27.26	16.83	33.00	11.03	22.80	15.01	13.59	—	12.02
Still grease ...	—	2.47	—	—	—	3.00	—	—	—
Paraffin wax ...	11.66	10.02	9.60	2.97	6.42	3.20	—	—	12.00
Still coke	—	—	—	—	—	—	—	—	—
Refuse and loss	18.23	26.03	22.59	—	—	—	—	—	—

From beginning to end the whole process of manufacture is a chemical industry of the highest technicality, and one that in administration requires expert knowledge.

MANUFACTURE.

From the mines the shales are raised in boxes to the crushers, and thence by hoist or incline to the retorts, where the first distillation takes place. These retorts are perhaps 60 feet high and taper top to bottom, being 4 ft. 8 in. by 1 ft. 10 in. in the interior at the base. They are of the continuous working type, arranged in batches together of 64, and will pass 4·5 tons of shale in the 24 hours. In accordance with the theory of the process the upper part of the retort is of iron, while the lower part has a firebrick lining. The shale passing downward is distilled in the upper part at as low a temperature as possible to obtain the highest yield of oil, and in the lower part, with the aid of steam introduced under a slight pressure at the foot of the retort, ammonia is formed from the nitrogen contained in the shales. Underneath the retorts, which are supported on pillars, little tramways are constructed, and through suitable openings in the foot of the retort the spent shale is run into tubs and thereafter hauled to the spent shale heaps. The distillates pass away continuously from the top of the retort to a vertical condenser, and the crude oil and ammonia run to a separating vat. The permanent gases left are scrubbed with oil and water, the first absorbing any light volatile naphthas which may have escaped condensation, and the second the ammonia; thereafter they return to heat the retorts, taking the place of coal or producer gas. The ammonia water from the separator is run off, caused to boil in a still, and the volatile ammonia expelled, to be directed into a receptacle or tank in which the ammonia comes in contact with sulphuric acid delivered through a perforated pipe in the bottom, and the resultant sulphate of ammonia is afterwards packed ready for the market.

(*To be continued.*)

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*Read before the Western Branch of the Scottish Federated Institute of Mining Students.

Luipaardsvlei Estate.

The following is the result of this company's operations for the month of March, 1914:—60 stamps ran 30·263 days, crushed 18,220 tons, yielding 1,949·151 ozs. fine gold; 3 tube mills ran 30·426 days, yielding 868·238 ozs. fine gold; sands treated, 12,830 tons, yielding 1,318·716 ozs. fine gold; slimes treated, 5,390 tons, yielding 521·483 ozs. fine gold; profit from operations, £3,201; sundry revenue, £1,001; total profit for month, £4,202; working costs, 17s. 11d. per ton; total working expenses, £16,346.

Crown Diamonds.

The following are the results of operations for the month of March, 1914:—Washed 26,651 loads, which have yielded 2,500¼ carats.

JOINT STAFF OF THE CONSOLIDATED MAIN REEF MINES AND ESTATE, LTD., AND MAIN REEF WEST, LTD.

WHOLESALE MINING AND MILLING.

A Further Object Lesson from America—What the Homestake Company is Doing.

THE subject of amalgamation bulks large in people's minds again at the present. The important evidence submitted by Messrs. R. W. Schumacher and Geo. Nathan to the Dominions Commission is dealt with elsewhere in this issue, and although it has to be admitted that any wholesale and rapid unification of the mines is impracticable and unlikely it is nevertheless true that thoughts are trending in this direction and that further consolidation is regarded by the technical and financial heads of the various mining Houses as the sovereign remedy for many of the present unsatisfactory features of the Industry. Attention may be directed to the results secured last year by the three leading mines of the Rand and of the world, which are dealt with in a special article in this issue. The figures there discussed throw an interesting light on the magnitude of the operations. The important point to be borne in mind is that only by the pursuance of a wholesale mining and milling policy can the vast low-grade tonnages of ore existing in the Rand be made to return a profit. The time will come when ore assaying only 2½ to 3 dwts. per ton will prove attractive, and in this connection the practice of the larger American gold mining companies is at the present moment of exceptional interest. We do not believe that the United States can teach us anything in regard to metallurgical practice, and the mines of North America possess marked advantages in regard to mining facilities because of the great widths of ore worked. At the same time the fact that ore of ultra - low grade value is being profitably worked in Alaska and South Dakota is not without a very special measure of interest to the Witwatersrand at the present. In our last issue we gave some particulars of what is being done in Alaska to-day on a basis of a dwt. and a half per ton recovery, and this week we give a few particulars regarding the Homestake Mine, which operates 1,000 stamps in South Dakota, and which from an ore carrying about 0·2 ozs. of gold per ton are recovering about one hundred thousand pounds per month. The Homestake during the past 30 years has won from 4 dwts. ore over twenty million pounds, of which £5,400,000 has been distributed in dividends.

"The Homestake ore lies in a mineralized zone of nearly vertical Algonkian slates and schists, having a general trend to the north-north-west and dipping slightly toward the east, into which enormous masses of rhyolite have been intruded; some of them contain garnet, some pyrites, and some graphitic material. The ore bodies follow roughly the direction of schistosity and show a general pitch southward. Where several unite, the aggregate thickness is considerably over 500 ft., and many stopes are carried across that width of ore.

"The ore varies greatly in its general character in different portions of the deposit, but that of the deeper levels usually contains either chlorite or ferruginous hornblende (cummingtonite) with quartz, pyrite, pyrrhotite, and carbonates of calcium, of magnesium, and of iron. Arsenopyrite, garnet and mica are met in varying proportions. In a general way it may be said that ferrous minerals predominate,* but in the upper portions of the deposit the iron of the sulphides, and to a varying extent of the other minerals, has been oxidized to limonite, etc.

"The bulk of the ore treated is obtained from five of the shafts, one of which is 1,900 ft. deep, but a certain amount is still got from open cuts. At the various shafts it is hoisted by cages in cars, and dumped near the mouths of the shafts over short slopes, which deliver the coarse rock to breakers of the Gates gyratory type. The broken ore falls into bins, in most cases excavated in the rock, from which it is loaded into trains of cars in a tunnel below. These are hauled to the Lead mills, and in part to the others, by locomotives actuated by compressed air. The cars are of the bottom-discharge type, and deliver between the tracks running centrally over the mill bins. At the Pocahontas and Monroe mills the ore is transported by cars driven by a cable, and at the Mineral Point it is conveyed directly by belts from the storage bins to the mill bins.

"Thence it is fed by Challenge feeders to mortars fitted with one inside amalgamating plate, where it is crushed wet by gravity stamps and passes over a series of amalgamating plates. A special cone system separates a small proportion of the coarsest sand, which is re-ground and returned. A system of cone classifiers, the last of the series provided with bottom water feed, separates successive portions of the fine slime. The sand is collected, drained and treated with cyanide solution, in vats from which the residues are discharged by sluicing. The slimes overflowing the various cones are thickened in clarifying tanks having conical bottoms and peripheral overflow, and the thickened slime is conveyed by a pipe line to a cyanide plant, where it is collected and treated in filter-presses, which are discharged without opening by an automatic sluicing device. Solutions are precipitated by zinc dust.

"Concentration proper is not practised and no ore is sorted. From the time the ore leaves the mine no elevation is necessary, and only a small proportion of the water has to be pumped back at certain stages.

"There are 1,000 stamps, crushing over 125,000 tons per month, of which 57 per cent. goes to the sand and 41 per cent. to the slime plant, between 1 per cent. and 2 per cent. of the slime being wasted. Of the total ore value 94 per cent. is recovered, about 72 per cent. as amalgam and 22 per cent. by the cyanide process. These are round numbers but are closely approximate. From an ore carrying about 0·2 oz. gold per ton the total monthly recovery is nearly $500,000.

"For 32 years, beginning with 1877, the open-shop system was in force throughout the Homestake works, union and non-union men being employed indiscriminately, but since the labour difficulty in November, 1909, only non-union men have been employed, the rates of pay and hours of labour remaining unchanged. Since 1907 eight hours have constituted a day's work in all departments.

"The minimum wage is $2.50 per eight-hour shift for adult labour on the surface and $3.00 underground, machine miners and skilled labourers receiving $3.50 and upwards. A few boys under 18 are employed in the mills and other surface plants at $1.50 and $2.00 per day. For employees in the stamp mills and cyanide plants the average pay is between $3.00 and $3.25.

"A free hospital is maintained for employees, and they and their families receive free medical service and medicines without restrictions.

"Each employee is required to pay $1.00 per month toward an 'Aid Fund,' to which the Homestake Company contributes at least $1,000 per month. This fund is governed by an elective board and pays $1.00 per day in case of temporary disability from sickness or accident; in case of death from disease or accident the sum of $800 is paid to the family of the deceased employee, while there is a graduated scale of benefits for permanent disabilities."

The above facts and figures are drawn from a paper read before the Institution of Mining and Metallurgy by Messrs. Clark and Sharwood some little time ago, and in discussing this paper Mr. H. F. Marriott remarked that he noticed the similarity of the conditions at the Homestake Mine to those of the Rand: the high wages, the high freight rates and the high altitude. That had led him to enquire in what way the average results at this mine also compared with those of the Rand. He had found that the results also showed a remarkable degree of similarity. The authors mentioned that the output from the property had been about $100,000,000, of which they had paid $27,000,000 in dividends. The records of the Rand showed that, from the commencement of operations on the goldfields to the present day, about 26 per cent. of the output had been distributed in dividends; and that during the last three years the average, which might be taken as more representative of systematic working than the figures which included all the early days, worked out at a little over 27 per cent. With regard to comparison of detailed results, the Rand costs were about 10s. a ton higher; but, on the other hand, it gave very nearly 10s. per ton extra yield, which preserved the balance. He was loth to criticize omissions in the paper, for otherwise it might have grown into a book, but a table of detailed costs would have added material interest to the discussion. Taking the figures which were given it appeared that the difference of the 10s. in the working expenses was mainly accounted for by the fact that on the Rand it was lode mining at narrow width and here it was quarrying in masses. A small amount of difference was probably due to the larger units in the treatment which the authors employed, but that again was left rather vague, because, although they had 1,000 stamps, these were distributed over six mills and the cyanide plants were more concentrated, so that it was not easy to compare the two.

Probably conditions as between Homestake and the Rand are more similar than between Alaska and the Rand, and the facts and figures alluded to in the above are therefore of very particular interest as showing the possibilities of working low grade ore at a profit in a district where high rates of wages obtain.

THE CROWN MINES' REPORT.

Concentration Policy Justified—Greater Economy in Working Despite Many Difficulties—Some Remarkable Figures as to Ore Reserves—A Record Tonnage and Profit.

Last year the Crown Mines maintained its position as being the most profitable gold mine in the world, and next to the Randfontein Central the most extensively operated. Moreover, the immensely strong ore reserve position was maintained and the ore blocked out in the constellation of industrial stars at present constituting the Crown Mines was, at the end of last year, worth, roughly, fifteen million pounds, or fifteen times the authorised capital of the company. These are stupendous figures. Indeed, the whole statistical portion of the report may be described as stupendous. Attached to the end of the report are figures showing the comparative annual returns of working expenditure, revenue, working profit and net profit. From this we find that the Crown Mines had milled up to the end of last year 10,938,215 tons. The average cost of working was 18s. 4d. per ton milled, the average working revenue 33s. 6d. per ton, the total working profit £8,303,861, the net profit £8,217,486, and the dividends paid £6,829,046. The report of this company for the year ended 31st December last has just been issued and as a study of the operations of the world's premier gold mining company it is to be recommended to the notice not only of shareholders but to students of mining finance and achievement generally. Despite the difficulties of the year, 1913 was a record for this company, which represents a consolidation of the best mining propositions of the West Central Rand. Not only were working costs at 16s. 5d. per ton milled the lowest recorded in the history of the company since the amalgamation, but the working profit earned (£1,442,473) and the tons milled (2,195,600) are the highest yet recorded by this company. The word " yet " is written advisedly, for under more favourable conditions still better figures can be obtained. Mr. Stuart Martin, the consulting engineer, makes a point of this in his report, when he writes: " This company is now well equipped, and with its large ore reserves, sound position as regards advance development, and its present organisation, can easily obtain its maximum results, only provided a fair native labour supply is forthcoming." The accuracy of this view finds expression in the results secured by the Crown Mines Company in the first half of last year. Indeed, the operations for the twelve months are described as being remarkable for the complete success of the policy of concentration, both on surface as well as in the mine, and the large tonnage output that was attained during the first half of the year. After the strike in July the native labour force at the company's disposal decreased in an alarming manner. The company employed:

		Europeans.	Coloured Labourers.
At May, 1913	... ...	1,895	14,416
At December, 1913	...	1,740	9,877
Difference	...	155	4,539

This decline in the labour force naturally resulted in a rapid decrease in the tonnage milled. In spite of this there was a gradual decrease in working costs—a sure reflection of the success of the improved working conditions now obtaining. Mr. Hy. Stuart Martin, the company's consulting engineer, in his annual report states, *inter alia*:—Compared with the preceding year, the tonnage milled shows an increase of 274,900 tons; the yield was lower by 2s. 5d. per ton milled, and of this 1s. 11d. was balanced by reduced costs. The profit realised from current working improved £128,226 owing to the increased tonnage dealt with. The development footage for the year amounted to 34,688 feet. This shows a considerable decrease as compared with the previous year, when a great deal of preparatory work, which is not required under current operations, was done. The most important features of the year's development were the extension of the 13th haulage level westwards, the driving of the 16th level haulage, the extension of the 19th level crosscuts and current development from the 13th to the 16th levels, with the necessary ore chutes and ore passes. The payable ore reserve has been re-estimated as at 31st December, 1913, and is shown as follows:—Main Reef Leader, 5,685,000 tons; value. 7·26 dwts. or 30s. 6d.; stope width, 62 ins. South Reef, 4,764,000 tons; value 6·30 dwts. or 26s. 6d.; stope width, 64 ins. Total and average, 10,449,000 tons; value, 6·82 dwts. or 28s. 7d. The above reserve may be analysed as follows:— (1) Tonnage completely blocked out for stoping, 9,129,000 tons; value, 6·81 dwts. or 28s. 7d. (2) Tonnage valued, but which will be completely blocked out by current development, 756,000 tons; value, 6·09 dwts. or 25s. 7d. Total, 9,885,000 tons; value, 6·75 dwts. or 28s. 4d. (3) Tonnage in shaft and boundary pillars, 564,000 tons; value 7·96 dwts. or 33s. 5d. Total ore reserve, 10,449,000 tons; value, 6·82 dwts. or 28s. 7d. Compared with the reserve at the end of 1912, little change is shown in the quantity. The value is ·27 dwt. lower, owing to slight modifications in the stoping width and to a factor introducing a margin of safety in the estimates of value. The above figures are exclusive of any reclaimable ore that may yet remain in the upper workings of the mine. As it became increasingly difficult, through lack of ventilation, to extend development and stoping in the western side of the mine, it was decided to sink a ventilating shaft near the extreme western boundary. This shaft, which is 18 feet in diameter, was commenced in May and had reached a depth of 1,013 feet at the close of the year, at a cost of £14,060, excluding surface equipment, or a total cost of £26,762, including sinking equipment and quarters for workmen. The rate of sinking has been rapid, and the cost low. Mr. Warriner, the general manager, writes:—The underground operations may be summarised as follows:—From stoping 2,407,267 tons were mined, in addition to which 76,355 tons were obtained from developing faces, making a total of 2,483,622 tons mined, of which 81,902 tons (3 per cent.) were from Main Reef, 1,246,355 tons (50 per cent.) were from Main Reef Leader, 1,155,365 tons (47 per cent.)

were from South Reef. Of the tonnage mined approximately 82 per cent. was stoped from the ore reserve. The stoping width in the Main Reef and Leader averaged 64 inches, and in the South Reef 67 inches. The development operations resulted in a total footage of 34,688 feet, as follows:—Drives, 15,342 ft.; winzes and raises, 8,404 ft.; crosscuts, 5,523 ft.; incline shafts, 1,026 ft.; vertical shafts, 1,013 ft.; sundry stations, ore chutes, etc., 3,380 ft. Of the total footage accomplished, 14,990 feet, or about 43 per cent., were in reef formation, the reef disclosures being:—Main Reef Leader, 9,420 ft.; width, 25 ins.; assay value, 14·0 dwts. or 58s. 10d. South Reef, 5,570 ft.; width, 33 ins.; assay value, 11·5 dwts. or 48s. 4d. The sum spent on capital account during the year has been comparatively very small, amounting only to £63,829 1s. 1d. The chief works undertaken were: (1) Installation of one 3rd stage winder at No. 7 shaft. (2) 16 additional rooms at western section compound. (3) Installation of travelling crane for 3rd winder at No. 5 shaft. (4) Sinking and equipment of No. 12 circular ventilation shaft. (5) Installation of water-borne sewerage system at the western compound. During the current year the expenditure will be somewhat larger, as it will include the erection of a third winder at No. 5 shaft. Apart from the cost of erection of this winder and the amount which will be spent in connection with the sinking of No. 12 shaft, no considerable expenditure is anticipated. 220,161 tons of sand have been filled into the worked-out areas of the mine during the year. All the exhausted areas in close proximity to No. 7 shaft have now been thoroughly packed, in order to protect the ground in the vicinity of this important thoroughfare from caving. A 7-inch borehole is also being put down in the neighbourhood of No. 3 shaft, through which it is hoped to send sand direct from the cyanide tanks of the Crown Deep plant to support the worked-out areas in this locality.

THE WORLD'S THREE LEADING GOLD MINES.

Crown Mines, East Rand Proprietary and Randfontein—Production Last Year 10 per cent. of the Output of the Globe—Ore Reserves Valued at £32,247,801—A Study in Millions.

The three leading mines of the Witwatersrand—Crown Mines, East Rand Proprietary and Randfontein Central—produced gold of a total value of £9,142,131 (including £70,349 derived from treatment of accumulated slime at the East Rand Proprietary) last year. Placing the production of the whole world at about ninety-one or ninety-two millions, this means that these three great consolidations produced between them practically ten per cent. of the entire output of the globe for 1913, a fact which must be regarded as striking testimony to the pre-eminence of the Transvaal gold fields and the overwhelming importance of the leading mines. In 1912 this industrial triumvirate produced £9,124,371, so that, despite strikes and shortage of native labour, last year's output results were in excess of those obtained in 1912. The value of the total output of the Witwatersrand last year was £35,812,605, so that the three mines in question produced well over a quarter of the output of the entire gold field. It is further of interest to calculate that the total profit earned by the three leading mines was £3,376,751 out of a total of £12,189,105 for the whole Reef.

Varying Characteristics.

It is instructive to note the results recorded by these three mines and to record their showings in parallel columns. There are, of course, different conditions obtaining at the properties under consideration. For instance, the Crown Mines represents a combination of the richest and most profitable gold mines of the Rand; of the whole world, in fact. The amalgamation brought under one administration what may be described as the golden two miles of the Rand, and although when operated on the present large crushing basis the ultra high grade returns of the twenty stamp battery days are no longer practicable, no longer politic at any rate, the recovery of the Crown Mines consolidation last year at 29s. 7d. was substantially above the Witwatersrand average of 27s. 9d. In the case of the East Rand Proprietary Mines a lower grade project has to be dealt with, whilst Randfontein again records a still smaller yield per ton milled, the recovery for last year being 24s. 6d. per ton, as compared with 24s. in 1912. Randfontein, too, has a peculiarity in the steep dip of its reefs, a characteristic making for a higher tonnage per claim, and at the same time conducing towards economy in working costs.

Capitals, Equipment and Profits.

From the tabular statement given below, it will be seen that the Randfontein Central Company carries the heaviest capital and has a larger equipment than either the Crown Mines or the great Farrar consolidation. Although running a lesser number of stamps than the E.R.P.M., it records the largest crushing of the three. When, however, we turn to the profitable and dividend aspects the immense advantages of the great Central Rand property are abundantly evident. The profit per ton at the Crown Mines getting on for double that earned by the West Rand mine and 2s. 3d. greater than the East Rand's showing, whilst the much lesser capital permitted of the payment of a vastly larger dividend percentage than the other two mines were capable of doing. It is worthy of particular notice that whereas in 1912 the Randfontein Central had the largest output and lowest working costs of the trio, the Crown Mines last year led not only in the matter of profit and profit per ton but in revenue and low working costs as well.

An Instructive Table.

The table referred to above is given hereunder. It should at the least prove instructive and help to give the lie to the many mugwumps who assert that gold mining on the Rand is a declining industry.

	Crown Mines.	Randfontein Central.	East Rand Proprietary.
Capital	£940,106	£4,193,700	£2,445,897
Property claims ...	2,222	4,515	4,515
Stamps at work ...	660	800	820
Tube mills at work ...			
Tons milled	2,195,600	2,533,043	1,769,000
Revenue	£3,248,132	£3,105,166	*£2,718,484
Revenue per ton ...	29s. 7d.	24s. 6d.	30s. 9d.
Working costs	£1,805,659	£2,182,032	£1,753,207
Working costs per ton	16s. 5d.	17s. 3d.	19s. 10d.
Profit	£1,442,473	£921,134	*£1,013,144
Profit per ton	13s. 2d.	7s. 3d.	10s. 11d.
Dividends	£1,031,117	£419,370	£611,474
Dividends, per cent...	110	10	25
Ore reserves	10,449,000	6,818,929	5,600,000
Average value	28s. 7d.	27s. 7d.	28s. 3d.

* Including proceeds from treatment of accumulated slime.

Ore Reserves.

Turning to the ore reserve aspect—probably the most important consideration of all in regard to a mining company—we again find the position of the Crown Mines immeasurably superior to that of either the E.R.P.M. or Randfontein. The reserves of the great Corner House mine exceed those of the E.R.P.M. by almost five million tons and are over three and a half million tons in excess of the Randfontein Central's tonnage. As regards value, too, the Crown Mines pay reserves exceed the average gold contents of the East Rand by over 4d. per ton, and of Randfontein by practically one shilling per ton. Reckoning the value of a dwt. of gold at 4·247 shillings, the following interesting calculations as to the reserves of the three mines under consideration may be arrived at:—

	Total value.
Crown Mines	£14,933,363
Randfontein Central	9,404,439
East Rand Proprietary Mines	7,909,999
Total for the three mines ...	£32,247,801

This compares with a calculated total of £34,661,644 at the end of 1912.

Expenditure and Profit Represented.

The above table is capable of classification according to profits in sight, and the sums represented in the reserves which on the bases of last year's costs will have to be expended to win the amounts of gold locked up in these tonnages. We arrive at the following statistics:—

	Working Expenditure.	Working Profit.
Crown Mines	£8,576,575	£6,356,788
Randfontein Central	5,881,325	3,523,114
East Rand Proprietary Mines..	4,993,334	2,916,665

These figures compare with the following calculations arrived at a year ago:—

	Working Expenditure.	Working Profit.
Crown Mines	£9,723,698	£6,246,681
Randfontein Central	6,491,666	3,516,394
East Rand Proprietary Mines..	6,263,854	2,419,351

It should be fully appreciated that the foregoing tables take no account of ore at present unpayable or of the influence of lower costs on the reserves blocked out. Any economic changes of this kind will, of course, bring about substantial alterations in the aggregate value of the reserves and also of the classification according to profit and expenditure. We publish these latter statistics without comment. It has not been our purpose to institute any close comparison between the three mines dealt with in the foregoing. Clearly such comparisons are impracticable where such a host of complex factors and varying considerations are at play. Rather has it been our intention to indicate the enormous importance of the three great consolidations of the Main Reef series and to, in some measure, demonstrate their stability and vast potentialities for the future.

THE EVILS OF THE PRESENT SYSTEM OF NATIVE RECRUITING

Director of Native Labour Criticises Existing Methods and Advocates the Voluntary System.

The statement on which Mr. S. M. Pritchard, the Director of Native Labour, submitted his evidence to the Dominions Royal Commission, on the subject of the recruiting of native labour is as follows:—

The recruitment of native labour for the mines is in the hands of (a) the Witwatersrand Native Labour Association—from Portuguese East Africa; (b) the Native Recruiting Corporation—from British South Africa. In addition, certain contractors, the larger of whom are Messrs. Mostert, Marwick & Morris, McKenzie & Hadley, supply a considerable quota of the native labour supply, and receive remuneration therefor on a shift basis as against a lump sum as capitation fee at the time the labourer is recruited. During the year 1913, 1,051 Europeans licensed under the provisons of Act 15 of 1911 were engaged monthly in recruiting native labour in the Cape Province, the Territory supplying the largest proportion of British South African natives for work on the mines. 827 persons were employed by these licensed persons as runners to assist them in the collection of native labour. The average number of labourers collected monthly by these agents was 5,027, or an average of 4·8 labourers monthly per licence holder, or 2·7 per individual (including runners). In the remaining Provinces a further 293 labour agents were operating monthly with approximately similar results.

OPPOSED TO PRESENT SYSTEM.

I am opposed to the present system of recruiting. (a) I hold that the number of agents operating is demoralising to both Europeans and natives. (b) I consider that recruiting on the present lines is unnecessary, more particularly since the majority of the mines have combined under a central recruiting corporation. (c) I strongly advocate the establishment of forwarding agencies as against a large force of recruiting agents, and believe that such a policy would result in no permanent reduction in the supply of native labour, but would tend to increase the number of voluntary natives, in addition to reducing recruiting costs. A temporary dislocation might result, but this possibility should be faced. (d) At the present time, owing to the high capitation fees, the system of giving advances to natives and the numbers of recruiters employed by the mining industry (practically every potential recruiter in native territory being in their employ), recruiting in British South Africa constitutes a monopoly for the large employers with large capital at their backs. The smaller employers have no chance of competing and a fair divison of the available native labour supply among the various industries of the Union is frustrated. (e) In this connection it is interesting to note that some 80 per cent. of the recruiters in the Cape Province are traders, and the results of their operations tend to show that they are in the business not so much for the purpose of securing profit accruing from recruiting proper as for the purpose of making recruiting an aid to successful trading operations. The only other apparent reason for the employ of these agents in such large numbers is to stifle competition. The chief obstacle to a voluntary system is the granting of advances. The majority of natives now coming forward have previously worked on the mines and would proceed voluntarily, if transport facilities were available and the influence of the labour agent with the additional inducement of an advance was not present. Such natives are intercepted rather than recruited. The expenses of recruiting to-day, with the advance limited to £2, are high, and can only be borne by the wealthier employers; but an increase of advances to £5, which is advocated by some, will make the position far worse and strengthen the monopoly enjoyed by the rich. The main objections to the existing methods of recruiting so far as they affect the natives themselves are: (a) A tendency to encourage extravagance by anticipating earnings and to keep them in perpetual debt; (b) the unfavourable position of the recruited as compared with the voluntary labourer, the latter being in a position to choose his employer and his class of work and generally to make terms; (c) the difficulty that the recruited native experiences in obtaining release from his contract whether after illness or for any other reason, the employer being chary of granting such release unless the whole or a portion of the expenses incurred in recruiting are made good to him; (a) a tendency to encourage fraud by natives in securing advances from one or more agents without any intention of proceeding to work.

ADVANTAGES OF VOLUNTARY SYSTEM.

On the other hand, a voluntary system of labour, combined with a system of deferred pay or regular remittances, while removing these objections, would, in addition, reap the following advances to natives or traders: (a) A better provision for the families of absentees who at the best are ill-provided for by an advance of £2—the labourer generally regarding the handing over of this amount as sufficient discharge of his obligations towards them—and dependent on the credit allowed by the trader, the potential labour value of the absentee or his relatives being regarded as the security for the granting of such credit; (b) an increased diffusion of money in native territories and the reconstruction of trading on a cash instead of a credit basis; (c) a tendency to retain parental control over the younger native and limit his spending powers at his place of work, where he is peculiarly liable to temptation.

"ABOLISH THE ADVANCE."

I recommend the total abolition of the advance system and the substitution of a voluntary system of deferred pay. It is reported that not only is the influence of the Government—represented by the Magistrates—being affected by present methods, but that traders have actually threatened a combination to control the output of labour. I cannot vouch for the truth of these reports; but it is conceivable that such a position might easily arise as the mining industry has, as it were, all its eggs in one basket. It is clear that the Government cannot interfere with legitimate competition in attracting native labour, and the influences of better pay, treatment and conditions of work; but I feel strongly that the Government should not associate itself with any artificial aids which have the effect of throwing labour into the hands of the wealthier employers.

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HYGIENIC ASPECTS OF THE MINING INDUSTRY.

Dust Diseases—The Dangers of Stonedusting—Influence of High Temperatures.

THE third of the Milroy lectures by Dr. F. Shufflebotham, Newcastle, Staffordshire, on "The Hygienic Aspect of the Coal Mining Industry in the United Kingdom," was delivered on Thursday, February 24, before the Royal College of Physicians, the subjects being "The Effect of Mine Dust upon the Health of the Workers" and "The Influence of Temperature and Humidity of the Atmosphere on the Health of the Miners."

Dr. Shufflebotham, in the course of his lecture, said that fibroid lung (such as potters suffer from) was rare amongst coal miners, and that anthracosis (the infiltration of the lung with coal dust) did not seem to entail disablement, and he concluded that coal dust was not an irritant of the lung. He suggested, however, that if shale dust and flue dust were used in mines to adulterate coal dust, with a view to prevent explosions, the siliceous character of the shale and flue dust might adversely affect the coal miners' lungs, just as the clay dust in potters' shops affects potters' lungs. He also suggested that the spraying of mines to render the coal dust less liable to explosion might cause a humidity which when added to high temperature and the darkness might be deleterious to the coal miners' health and prove favourable to the development of ankylostomiasis, now practically unknown in British coal mines. The lecturer pointed out that in coal mines the worker came in contact with two kinds of dust—coal dust and siliceous or rock dust. The siliceous dust was produced when new workings were opened up, and when new roadways were cut out, but in the well-established mines of the country the vast majority of workers only came in contact with coal dust. Prior to the existence of this Act of Parliament, one of the principal diseases from which miners suffered was fibrosis of the lungs, or miners' phthisis, and Dr. Greenhow's pathological collection of specimens of miners' lungs, which are to be found in the museum of the Middlesex Hospital, show that this disease was in many cases the actual cause of death. The statistics of the Registrar-General also show that the mortality figure for miners from diseases of the respiratory system was very much greater than it is now; but at the present time, in Great Britain, fibrosis of the lung among miners can be said to be practically non-existent, and its disappearance can be wholly attributed to the enforced improvements in the ventilation of mines, to the improvements in the illumination of mines, and to shorter working hours. The evidence that was given before the Departmental Committee on Industrial Diseases, which sat in 1906 and 1907, was practically unanimous on these points. While all the evidence went to prove that fibroid phthisis is a disease which does not affect coal miners at the present time in this country, still, anthracosis, or infiltration of the lung with coal dust, is widely found. Post-mortem examinations of coal miners invariably showed the lungs to be thickly charged with carbonaceous deposit, and often to such an extent as to make the lung appear to be as black as coal. This condition alone did not point to pulmonary disease. He had been present at many autopsies on miners, and had found the lungs to be loaded with coal dust, and the bronchial glands deeply pigmented from the same cause, and yet the lungs throughout life had fulfilled their functions most satisfactorily, and there had been no history of any lung trouble. The lecturer presented several illustrations, and said they showed that lungs heavily charged with coal dust were not incompatible with good health. Anthracosis must be regarded in coal miners at the present time, not as a pathological condition, but simply physiological in nature. He discussed in detail the microscopic appearance of coal miners' lungs, and said it confirmed the opinion that coal dust could not be regarded in any way as an irritant to the lung tissue. He also said that in his opinion the bulk of the evidence went to show that the entrance of coal dust or siliceous dust into the lung was through the aerial passages and not by way of the intestinal canal. The lecturer pointed out that tuberculosis of the lungs is not so commonly found among coal miners as among many other occupations, and said: As a result of their experiments, Wainwright and Nicholls dismissed the theory that coal dust possesses any germicidal property, although they believe that coal dust in the lungs does exert a real protective influence against the tubercle bacilli, but that the reduced mortality from tuberculosis is not due to any supposed antiseptic property of the coal dust, but that the coal dust produces a stimulating effect on the lung tissue, with an increased growth of connective tissue. Nicholls advanced the theory that the protective influence of the coal dust was due to the action of the soluble calcium salts which formed a large proportion of the ash of the coal dust. The lecturer discussed in some detail the prevalence of lung diseases among the ganister workers and Cornish tin miners. He also referred to miners' phthisis amongst the gold miners of the Transvaal and Australia, and also discussed the symptoms and physical signs of fibroid lung, with special reference to a fatal case of silicosis (the case of a potter).

DANGERS OF STONEDUSTING.

Dr. Haldane had many times expressed the opinion that coal dust, containing no free silica, had no injurious effect upon the lungs, but that siliceous dust—that is to say, dust containing free silica or any hard material—was extremely dangerous. The lecturer referred to the experiments by Dr. Beattie with guineapigs as to shale dust from the Altofts Colliery and fibrosis of the lung; but said that these experiments, which seemed to deprecate an extreme view as to the dangers of stone dust, were entirely different from the slow and regular inhalation of dust which would occur in a case of a miner in a coal mine. In Dr. Beattie's experiments there was no exposure to the dust on the second and third days, and in each week there was no exposure for more than five days. One could not help but feel that the forcible way in which the dust was inhaled and the short exposure to this violent inhalation were conditions totally different from those found in the mine, and the lecturer did not think it fair that any just comparison should be made by these experiments upon guineapigs when the maximum had only been for 65 hours over a period of 51 days. The action of siliceous dust was always insidious, and there might be no symptoms apparent for many years. The pathological condition was due to the accumulative effect of the mechanical irritation of the crystalline or hardened dust, and it was common knowledge that the exposure for a short period of time would have little effect upon the lung tissue of men exposed to the inhalation of an atmosphere contailing siliceous dust. He quoted experiments by Dr. J. W. Mellor, Stoke-on-Trent, to show the comparatively solid particles in stone dust. Dr. Mellor's analyses emphasised the importance of further investigation and experiments into the question of the kinds of dust which shall be used for the purpose of preventing explosions. A dust which contained 35 per cent. of quartz and nearly 50 per cent. of agrillaceous matter must be viewed with profound distrust if the health of the worker was to be considered. Dr. Beattie appeared to have lost sight of the importance of the size of the dust granules in making his investigations. It could not be too clearly understood that it was only fine dust that entered the lungs, and in this way proved dangerous; further, it was only fine dust that would render the coal dust inert. It would appear that if this method were employed, while one evil was being remedied another insidious evil might be produced, and it was possible that we might have a condition of things in English mines similar to what prevails on the Rand and in Australia. This trouble would not be apparent at the beginning; some years might elapse before the disastrous effects of the inhalation of this siliceous dust would be seen; but when the condition of fibroid lung had been set up, the course of the disease would run in the same way as was found in the South African miners, among the grinders of Sheffield, and as was formerly found among the Staffordshire potters.

THE INFLUENCE OF TEMPERATURE ON HEALTH.

Discussing the influence of temperature on the health of miners, the lecturer said the tables of Prof. Cadman and Mr. Whalley showed that the dry bulb temperature of some of the mines register 95·5 degs. Fahr., 96 degs., 92 degs., 97·8 degs., 88·8 degs., and 87 degs. Fahr., and the same observers found that the wet bulb readings in certain mines were 79 degs., 82·5 degs., 77 degs., 79·8 degs., 82 degs., 81·5 degs., and 87 degs. Fahr. in different mines, and Dr. Shufflebotham had made observations himself in coal mines where the dry bulb reading had registered as much as 90 degs., and the wet bulb at over 80 degs. It would therefore be seen that in a considerable number of mines the men were working at very high temperatures, and it could not be denied that these temperatures were not only injurious to the health of the worker, but without doubt they had a considerable effect upon their working capacity. The lecturer touched upon the physiological effects of high temperatures, especially when registered by the wet bulb, upon the human body, and he quoted experiments by Dr. Fraser Harris, Prof. Langlois (of Paris), Prof. Cadman, Dr. E. H. Hunt (India), Dr. Haldane, and Dr. Pembrey, the general conclusion being adverse, though Prof. Cadman's observations suggested that men who were continually working in high temperatures seemed to become acclimatised and could stand the effect of such temperatures more easily than persons who were not accustomed to work under such conditions. The question of wet bulb temperatures in coal mines had become all the more important on account of the spraying by water of coal seams and roadways for the purpose of preventing explosions, and it could be easily understood that in mines of high temperature, with an atmosphere saturated with moisture, while the risk of explosions was diminished, the working conditions were less favourable both to the health of the miner and to his efficiency as a workman, apart from the consideration of explosions. With regard to factories, particularly in the weaving sheds of Lancashire, the law had stepped in to limit the temperature with regard to the wet bulb reading, and in the principal Continental mining countries, there are legal restrictions with respect to the temperature of the workings. In France, for instance, work was forbidden, except in cases of absolute necessity, in any working place where the temperature exceeds 35 degs. Cent. (95 degs. Fahr.) on the dry bulb thermometer, or 30 degs. Cent. (86 degs. Fahr.) in the wet bulb thermometer. According to the French Mining Law, any temperature exceeding 25 degs. Cent. (77 degs. Fahr.) on the wet bulb thermometer must be considered high, and continuous work at this temperature would be arduous when the air was very damp; that was, when the difference between the wet and dry bulb readings does not exceed 2 or 3 degrees at least. Another important point in connection with the watering of mines where the temperature exceeded 70 degs., which must not be overlooked, was that favourable conditions were being created for the development of ankylostomiasis, should the disease become introduced into the pit. Up to the present English coal mines had not, as far as we know, been infected with this disease, but when one considered the frequency of this disease in the tropics and in the mines of South Africa, India, and South America, and that a large number of men continually return home to resume work in the mines of this country, it was impossible to shut our eyes to the possibility of infection of the mines. In addition to these possible sources of infection, there was a large number of Poles working both in the coal mines of Scotland and also in South Wales, and these workers might also be carriers of the disease. On the opening up of the Kentish coalfield, where the seams are of great depth and the temperature correspondingly high, there might be an inrush of French and Belgian or even Polish miners, and Dr. Shufflebotham considered that it behoved the management of these pits to keep a keen look-out for the possibility of ankylostomiasis being found among them.

THE POSITION AT THE BANTJES.

Reduced Yield Owing to Crushing of Lower Grade Ore—Development Now Improving.

The chief points of comparison at the Bantjes in the years 1913 and 1912 are:—Tons mined (1913) 329,137 tons, (1912) 327,710 tons; ore from surface dumps (1913) 5,856 tons, (1912) nil; percentage sorted (1913) 10·2 per cent., (1912) 12·6 per cent.; tons milled (1913) 300,440 tons, (1912) 286,453 tons; yield per ton (1913) 25s. 11d., (1912) 29s. 6d.; working costs per ton (1913) 22s. 8d., (1912) 24s. 1d.; working profit (1913) £48,388, (1912) £77,746. According to the consulting engineer, Mr. Palmer Carter, the scale of operations showed a small improvement, more particularly in the first half of the year when the native labour supply was sufficient, but the total profit realized amounted to but £48,388, a reduction of £29,358 as compared to 1912. A fall in yield of 3s. 7d., to some extent offset by a reduction in working costs of 1s. 5d. per ton milled, was entirely responsible for this result. The reduced yield was brought about by the inclusion of a considerable quantity of low grade ore from surface dumps, a lower percentage of sorting, and to erratic values obtained in stoping. Development has been conducted on an increased scale and shows an improvement of 3,194 feet over the previous year. The payable tonnage developed for the year is estimated at 369,200 tons of 5·7 dwts. value. The payable ore reserve has been re-estimated, and at the 31st December, 1913, stood as follows: Leader, including some Main Reef, 158,900 tons; value, 6·1 dwts., or 25s. 7d.; stoping width, 44 ins. South Reef, 815,800 tons; value, 6·3 dwts., or 26s. 6d.; stoping width, 42 ins. Total, 974,700 tons; value, 6·3 dwts., or 26s. 6d. The above tonnage consisting wholly of block ground may be segregated as under:—(a) Ore in blocks available for stoping, 728,400 tons; value 6·2 dwts., or 26s. 0d.; (b) Ore exposed and valued which will be rendered available by current operations, 143,500 tons; value 5·9 dwts., or 24s. 9d. Total, 871,900 tons; value 6·1 dwts., or 25s. 7d. (c) Shaft, boundary and safety pillars, 102,800 tons; value 7·5 dwts., or 31s. 6d. Grand total, 974,700 tons; value 6·3 dwts., or 26s. 6d. Compared with the previous year the reserve shows an increase of 133,900 tons, whilst the value is 0·7 dwt. lower. This position has been brought about by the lower value of the ore developed for the year; a small increase in the estimated stoping width, considered advisable in connection with the more extended use of machine drills, and the inclusion of certain low grade blocks of ore, which can now be regarded as payable under improved working cost conditions. In addition to the ore reserve there are developed in the mine some 256,200 tons of low grade ore, much of which will no doubt be worked as working expenses are reduced. Underground ventilation conditions have been improved by the conversion of the main shaft into a downcast. The machinery and plant have been maintained in good order; the reduction works have given satisfactory results at a reduction in expenditure of 8d. per ton milled.

THE YEAR WITH THE DURBAN ROODEPOORT DEEP.

Labour Shortage Reduces Profits and Restricts Development.

For 1913 at the Durban Roodepoort Deep, the following are the chief points of comparison with the preceding year:—Per cent. sorted (1913) 12·9; (1912) 17·7; tonnage milled (1913) 291,590, (1912) 293,995; yield per ton milled (1913) 28s. 10d., (1912) 29s. 11d.; working costs (1913) 24s. 5d., (1912) 24s. 4d.; working profit (1913) £64,235, (1912) £82,085; capital expenditure (1913) £4,786, (1912) £15,034; development footage (1913) 12,358, (1912) 15,555. The results for the year were adversely affected by the miners' strike in July, the consequent severe shortage of native labour during the latter half of the year resulting in a considerable decrease in the working profit earned and also in a curtailment of development operations. The working profit for the year at £64,235 is a decrease of £17,849, and is due to the lower tonnage milled and the reduced yield. In his annual report, the acting consulting engineer, Mr. Palmer Carter, writes:—Owing to the shortage of the native labour supply, and the unsuitability of the South Reef for machine stoping, it became necessary to mine increasing quantities of Main Reef by rock drills. The proportion of Main Reef mined, viz., 49 per cent., is therefore the highest yet reached on this mine. The fall in yield is traceable to this policy, and the fact that a smaller quantity of waste rock was sorted. The development footage amounted to 12,358 feet, and is 3,197 feet lower than that of the previous year. Good progress was made with the 12th level main haulage drive, and the sinking of No. 1 incline was re-started; the new underground incline below the 11th level in the section west of the big dyke was commenced during the latter part of the year. The reef exposures on Main Reef in the known chute near No. 2 shaft still continue good, and on the 12th level No. 1 shaft, the drives east and west on South Reef have disclosed values up to the average grade of the mine. The payable tonnage developed during the year amounted to 268,200 tons of an estimated value of 6·8 dwts. The payable ore reserve has been re-estimated as at 31st December, 1913, as follows: Main Reef, 569,800 tons, value 6·0 dwts. or 25s. 2d.; stoping width, 56 ins. South Reef, 742,900 tons, value 7·2 dwts. or 30s. 3d.; stoping width, 42 ins. Total, 1,312,700 tons, value 6·7 dwts. or 28s. 2d. The above tonnage, consisting wholly of blocked ground, may be segregated as under:—(a) Ore in blocks available for stoping, 831,000 tons, value 6·3 dwts. or 26s. 6d.; (b) ore exposed and valued which will be rendered available by current operations, 132,200 tons, value 7·4 dwts. or 31s. 1d.; total, 963,200 tons, value 6·5 dwts. or 27s. 4d.; (c) shaft and boundary pillars, 319,500 tons, value 7·3 dwts. or 30s. 8d.; grand total, 1,312,700 tons, value 6·7 dwts. or 28s. 2d. The above reserve, compared with last year, shows an increase of 6,600 tons, but a decrease in value of 0·2 dwt. The new pumping plant at the 12th level No. 1 shaft was started in September, and is working satisfactorily. With the completion of the 12th level all water will be pumped by this plant. No. 2 and 3 shafts, whilst not giving any serious trouble during the year, have been a heavy burden on maintenance charges. The native labour position was from July to December, and is still, very acute, and the mine is suffering severely from this shortage. It is most important that labour be obtained shortly, if normal working results are to be obtained, and the development position maintained.

New Heriot.

Tons milled, 13,728; gold recovered, 5,632 ozs.; profit, £10,090.

Rooiberg Minerals Development Co.

Stamps, 10; days run, 28·649; tons milled, 3,499 short tons; concentrates, 105 long tons; average assay value metallic tin, 68·49 per cent.; estimated profit, £4,444 5s. 11d.; adjustments in respect of previous shipments to be subtracted, £336; profit declared for the month, £4,104 5s. 11d.; net capital expenditure, £530 11s. 2d. The sum of £2,529 0s. 1d. has been included in working costs for the month in respect of shaft sinking, exploration and mine development. The average price of metallic tin on which the month's revenue has been determined is £175 14s.

THE VILLAGE DEEP'S SATISFACTORY ANNUAL REPORT.

Points from the Consulting Engineer's Review for 1913.

In his annual report on the Village Deep, the consulting engineer, Mr. H. Stuart Martin, writes:—

Although the improvement in the scale of operations recorded in 1912 has not been maintained, the results of the past year can be regarded as satisfactory, taking adverse conditions into consideration. For the first six months of the year the mine was in possession of a good labour supply, and the profit averaged £25,000 a month from 48,816 tons milled. Following on the labour disturbances in July, the labour force has steadily decreased, with the result that for the second half-year the tonnage milled has averaged 40,400 tons for an average monthly profit of £16,178. In comparing the total profit earned with that of the preceding year, it must be noted that the 1912 profit included £23,488, the value of the reserve gold then in hand. Excluding this sum, the fall in profit as compared with 1912 is £24,212. Development operations have been fully maintained, and show an increase of 1,641 feet, and in addition a large amount of excavation work has been done in connection with permanent underground equipment at the head of the Turf Mines incline shaft. The cost of development has therefore been unusually high. The payable tonnage development for the year was 865.300 tons of 6·6 dwts. value, a satisfactory result. The high percentage of payability disclosed, recorded in the manager's report, is to be noted. The payable ore reserve at 31st December, 1913, has, as customary, been re-estimated and re-valued, with the following result:—Main Reef Leader, 2,192,900 tons at 6·7 dwts., or 28s. 2d. per ton, over a stope width of 61 inches; South Reef, 469,700 tons at 6·4 dwts., or 26s. 10d. per ton, over 54 inches stope width; total, 2,662.600 tons at 6·6 dwts., or 27s. 9d. The above ore reserve may be classified as follows: (1) Ore completely blocked out for stoping (net ore reserve), 2,142.900 tons at 6·9 dwts., or 29s.; (2) ore contained in shaft and boundary pillars, 519,700 tons at 5·6 dwts., or 23s. 6d.; total, 2,662.600 tons at 6·6 dwts., or 27s. 9d. In addition to the above reserve, there are 267,200 tons blocked out by development, but which require boxhole raises for valuation. The net ore reserve, when compared with the preceding year, shows an increase of 220,500 tons, with a reduction in average value of 0·1 dwt. per ton. The increase is due partly to the increased development operations, and partly to the fact that a large proportion of the ore blocked out but not valued at the close of the previous year, has since been valued. In addition to the payable reserve, there are standing developed in the mine 476,000 tons of a value between 3·5 dwts. and the present limit of profitable mining. The policy of concentrating hoisting operations at the Turf Shaft by gradually closing down Nos. 1 and 2 shafts has made progress during the year. Thus it has been possible to cease hoisting from No. 1 shaft, the ore from this section of the mine being lowered to the main haulage road on the 16th level and then transferred to the Turf shaft. The tonnage hoisted through the Turf shaft has been 289,000 tons as compared with 38,000 tons in 1912. The capital expenditure on equipment for the year amounted to £34,659 17s. 7d., the principal items being in connection with the equipment of No. 3 incline shaft, a new man hoist at No. 2 shaft, and improvements in living conditions for employees. During the current year a further sum of about £23,387 may be required to complete the electrification of the plant and the arrangements at No. 3 shaft. The outlook for the future is promising. The underground arrangements are now such that more use can gradually be made of No. 3 shaft, so that it will be the main hoisting shaft of the mine, thereby justifying the high standing charges incurred in its working. The position of the ore reserve is sound, and the number of points of attack are numerous. The depth attained in the No. 3 shaft incline, 189 feet below the 21st level, makes it possible to open up new levels well ahead of current working. On the whole, given a fair supply of labour, the results for the year 1914 should show improvement The management and staff have been untiring in their loyal service to the mine.

POSITION AND PROSPECTS OF THE MODDER B.

Increased Tonnage Milled—Working Profits Higher—The Future Policy.

The total working profit of £153,530 earned by the Modder B. in 1913 from the milling of 404,580 tons of ore is very satisfactory; the profit is £71,377 higher than in the preceding year. This is the combined result of an increase of 16,010 tons in the quantity milled, of 1s. 5d. in the yield, and a decrease of 1s. 4d. in working costs, the profit for 1913 being at the rate of 22s. 5d. per ton milled. The ore mined has been above the average grade of the whole ore reserve as it existed at the commencement of the year 1913: this has, however, been justified by the improved values disclosed by the year's development operations. The consulting engineer, in the course of his annual report, says: Strict attention has been paid to the exclusion of unprofitable ore in the ore hoisted, by separating as much waste rock as possible underground and using it as packing for supporting the hanging wall of the stopes. Development has been carried out with an increased measure of success, resulting in a total footage of 14,064 feet—5,461 feet more than in 1912. The tonnage of payable ore developed during the year is estimated to be 585,081 tons of 12·5 dwts. value. The greater portion of the development work was done in that part of the mine lying to the west and south of the main shaft, where there is greater certainty of early success in placing the mine development in a strong position, and where the country is comparatively free from serious disturbances, faulting, and barren ground. One important development has, however taken place in the eastern section, where a winze sunk from an old prospecting shaft has disclosed 16 inches of reef of an average value of 20 dwts. over a distance of 200 feet, which is encouraging. The continuation of this winze will be of much assistance in clearing up the rather difficult geological problems in this section of the mine, where the development so far done on the 2nd level has been in very disturbed ground. The future policy is to extend development in the eastern section as rapidly as possible, at the same time continuing the main points of attack in the undeveloped area on the western side. The ore reserve has been re-valued at 31st December, 1913, and shows a total of 2,800,400 tons of payable ore of an average value of 8·3 dwts. or 34s. 10d. over an average stoping width of 55 inches. Compared with the previous year, this is an increase of 206,400 tons and an improvement in value of 4s. 7d. per ton. The above tonnage represents a life of five years, based on the increased milling output of 40,000 tons a month. In addition to the above, there are developed 389,600 tons of 3·9 dwts. value, which may at some future date be mined with profit. The high efficiency obtained in stoping has been well maintained, and the underground mechanical arrangements for handling ore have continued to work very satisfactorily. The system of waste packing which was originally adopted has been continued at a cost of 10d. per ton milled, and this expense has thoroughly justified itself in so far that there have been no stoppages or delays due to crush in the continuous working of the mine. Development suspense has been credited at the rate of 1s. 6d. per ton milled. This amount has approximated to the actual expenditure during the year, and the fund stands at £23,477. The renewals account, which has been credited with 3d. per ton milled for the greater part of the year, has increased to £15,066 at the year's end. Capital expenditure for the year amounted to £25,723. Details of this are scheduled in the manager's report, the chief items being the extension to sand and slime plant and housing accommodation for employees. The capital expenditure for the current year will be approximately £52,000, which will mainly be spent on the additions to the plant. During the past year the mill has been pressed very hardly, and has at times been worked beyond its capacity, giving a higher residue than that which would result by the best metallurgical practice. Several additions have therefore been made to the cyanide plant, the most important being two extra slimes tanks and a clarifier, whilst two additional sand tanks are in process of construction. The additional stamping capacity will consist of 16 new Nissen stamps and a tube mill. The battery foundations are under construction, and it is hoped that, if deliveries are up to time, the plant will be able to deal with the increased tonnage by August next. With an improvement in the native labour force there will be no difficulty in supplying the additional ore. To ensure that the best health conditions shall prevail underground, every provision has been made to ventilate the working and to lay dust by watering. Operations at the mine were completely suspended for nearly five days in the early part of July, owing to the strike, and the results for that month were naturally abnormal. Much praise is due to the management and staff for their unflinching loyalty during this period of trouble. With the strong reserve of ore opened up for stoping, and the sound financial position in which the mine is now placed, there is every reason to look forward to continued successful working.

"T.C.L." PROSPECTING AND MINING IN 1913.

Review of the Many "Outside" Mining Activities of the Company.

In his report on the company's prospecting and mining operations for the year 1913, the consulting engineer, Mr. Jervis Garrard, writes, *inter alia*, as follows:—

No new prospecting agreements were given out during the year over any of the company's farms reserved from public prospecting. The agreement granted over the farm Sedan No. 1841, district Waterberg, lapsed during the year; very little prospecting was done and nothing of value reported.

Witfontein No. 371, and Newburg No. 937, District Waterberg.—921 feet of sinking, rising, driving and crosscutting have been carried out during the year on the tin occurrence in the shales and felsites of the Lower Waterberg series, making a total as at 31st December, 1913, of 2,131 feet of surface trenching and 2,214 feet of sinking, driving and rising. The present mine comprises a vertical main hauling shaft 150 feet deep, with drifts north and south at the 54 feet, 88 feet, and 150 feet levels, driven on the fissure and connected by winzes. The ore body is irregular in shape, dipping slightly south along the fissure, and throwing out enrichments into the shales where these are intersected. It has been developed in the 88 feet level south from the main shaft for 186 feet, fair tin still showing in the face, and it is estimated (as far as is possible in the case of an irregular ore body) that 3,000 tons of an average grade of 2 per cent. of 70 per cent. concentrate, and 3 per cent. of copper, have been exposed, and a further 2,000 tons of the same value have been dumped at grass. The 150 feet level south exposed, at the end of the year, a promising enrichment along the fissure, which is now being opened up. Extraction tests are in progress to determine the best method and cost of treating this complex ore.

Welgevonden No. 777, and Welgelegen No. 357, District Waterberg.—No further work has been carried out by the company during the year. The negotiations for the granting of a tributing lease on Welgevonden, mentioned in last annual report, resulted in such a lease being granted over 51 morgen 25 square roods. This area covers the work reported in the annual report for 1911 as having been done by a syndicate on Welgevonden under the impression that they were working on the adjoining farm Waterval. A minimum rental of £10 per month is being received, but, no ore having yet been treated, no royalty has been received.

Weynek No. 763, District Rustenburg.—No development work has been done during the year. The question of a plant for dealing with the ore developed has been postponed until such time as it can be seen whether such plant could also be used at Witfontein when the Weynek ore is exhausted.

Mutue Fides No. 1844, District Waterberg.—The tin occurrences in the red granite, referred to in the last annual report, on the company's portion of this farm, have been further prospected and opened up during the year. Besides a good deal of general prospecting by trenches and small holes, 585 feet of driving, sinking and crosscutting have been done, and it is estimated that there are at grass 791 tons of ore containing 106·8 tons of 70 per cent. concentrate, and developed in the mine 890 tons containing 73·5 tons of 70 per cent. concentrate, making a total of 1,681 tons of ore containing 180·3 tons of 70 per cent. concentrate. This tonnage is derived from two occurrences situated close together. Owing to scarcity of native labour during the year, it has not been possible to carry out much general prospecting work, or to open up several tin occurrences already located. An 8-inch borehole is now being put down to endeavour to locate sufficient water for a reduction plant, the nearest natural supply being seven miles distant. A considerable amount of prospecting has been carried out on the company's farms in the neighbourhood of Mutue Fides, but without favourable results.

Mutue Fides and Tygerpad Tributing Area.—On this area of 700 yards by 700 yards the holders (the Olifants Tin Mines, Ltd.) have done some prospecting work from which a quantity of ore containing tin has been dumped. No royalty has, however, so far been received, as no tin has yet been treated.

Zaaiplaats Lease.—Work during the year has for the most part been confined to opening up the ore body originally located by diamond drilling at a point 100 feet (measd on the dip) to the south of No. 1 adit. 230 feet of driving, crosscutting, raising and winzing have been accomplished in this No. 7 A working, of which 110 feet were on tin, the vein being tin-bearing for 50 feet along the drift, 40 feet in the winze,. and 20 feet in the rise. Good ore still continues, however, in the face of the drift, but, owing to the acute shortage of native labour, underground operations had to be temporarily suspended in November. Further exploratory work in the No. 1 adit workings also revealed profitable ore in advance of the stope faces previously thought to be worked out. The accumulated ore at grass at the 31st December, 1913, is estimated at 414 tons, containing 17·68 tons of 70 per cent. concentrate, obtained from development in No. 7A working.

Roodepoort Tributing Lease.—The Zaaiplaats Tin Mining Company, Ltd., continues to work this lease. The company received during the year as its share of the ore mined 2,205 tons of ore, of which 914 tons containing 17·53 tons of 70 per cent. concentrate were treated at the Groenfontein mill. The bulk of the remaining tonnage consists of fines assaying about 1 per cent. metallic tin, which can be treated at a profit. The main working known as No. 5 passed out of Roodepoort into the Zaaiplaats Company's ground in the latter part of the year. Some work was also done on No. 2 and No. 4 workings, but the results were not encouraging.

Mount Morgan Mine, District Barberton.—No work has been carried out here during the year. A process which will cheaply and efficiently deal with the refractory ore developed has not yet been discovered.

Dientje No. 552, District Lydenburg.—The Government intimated its intention of proclaiming this farm, and requested the company to select its mynpacht if it desired one. Under these circumstances it was considered advisable to do some further prospecting. So far, nothing of a profitable nature has been disclosed

Butterfly-Cecil Group, Rhodesia.—The results obtained from this property were not up to expectations, and, an opportunity occurring, it was sold at a small loss.

George Claims, District Barberton.—No further work has been carried out on this property during the year, but the question of erecting a small mill is still under consideration.

Montrose Claims, District Barberton (125 claims).—These claims, pegged on the farm Montrose, have been opened up, and it is estimated that there are 17,500 tons of oxidised ore, averaging 8·8 dwts. fully developed, and 20,000 tons of oxidised ore, averaging 7·6 dwts., partly developed, totalling 37,500 tons of oxidised ore averaging 8·1 dwts., the ore body varying in width from 3 feet to 15 feet. Metallurgical tests on this ore resulted in a recovery of 85 per cent. by ordinary cyanide treatment without fine grinding. Sinking to the second level exposed pyritic ore which was found to be refractory, and, as a heavier inflow of water than could be handled without power pumps was met with at a depth of 95 feet, the further exploration of this level was postponed until a plant to deal with the oxidised ore had been erected and power made available.

Barberton Venture.—Prospecting work has been carried out over a large area of country practically covering the whole of the sedimentary gold-bearing belt of the Barberton district. The company's interest in this venture is 40 per cent. Many reefs were located, but on being systematically prospected and sampled were not found profitable over a sufficient length of strike to warrant opening up. During the last months of the year all work was concentrated on a block of ground comprising about 882 claims on which some promising reefs have been disclosed. Prospecting and development on this block of ground is proceeding.

MINING INTERESTS HELD BY COMPANY.

Fairview (T.C.L.), Ltd.—1,596 feet of driving, sinking and rising have been carried out during the year. Total tonnage mined during the year, 16,400 tons; total tonnage standing developed at 31st December, 1913, 22,170 tons, of an average value of 12·186 dwts. over 35 inches. Profitable ore continues to be developed. During the first part of the year the plant was running on a restricted tonnage to obviate undue loss in residues pending the erection of the additional plant. These additions were completed in July, and came into use during August. The plant is now running satisfactorily, and during the last quarter of the year the duty per stamp has been 33·4 tons per day, the recovery 83 per cent., and the residue 1·78 dwts., as against residues of 3·14 dwts. previous to the alterations, showing an increased recovery of 1·36 dwts per ton with the altered plant. Number of stamps, 2 Nissen stamps; running time per day of 24 hours, 295·126 days; duty per stamp per 24 hours, 27·759 tons; number of tube mills in operation, 1; running time of tube mill, 296·164 days; tons crushed (in cyanide solution), 16,385 tons; tons treated, 16,105 tons; total yield in fine ounces, 6,404·034 ozs.; estimated value of output, £26,802; estimated value per ton milled, 32s. 9d.; estimated profit, £6,550; estimated profit per ton milled, 8s

Rietfontein (T.C.L.), Ltd.—2,510 feet of driving and crosscutting, 806 feet of winzing and rising, and 175 feet of incline shaft sinking to 3rd level, making a total of 3,491 feet of development, were done during the year. It is estimated that 7,100 tons of ore are fully developed, averaging 14·8 dwts. over 35 inches. Number of stamps, 2 Nissen stamps; running time per day of 24 hours, 255·143 days; duty per stamp per 24 hours, 24·347 tons; number of tube mills in operation, 1; running time of tube mill, 265·738 days; tons crushed, 12,424 tons; tons treated (557 tons treated more than crushed, due to emptying of all tanks in December for plant alteration), 12,981 tons; total yield in fine ounces, 4,549·255 ozs.; total yield from mill in fine ounces, 2,216·927 ozs.; total yield from cyanide works, 2,332·328 ozs.; sands treated, 8,781 tons; slimes treated, 4,200 tons; estimated value of output, including by-products, £19,589; estimated value per ton milled, 31s. 6d.; estimated profit, £2,678; estimated profit per ton milled, 4s. 4d. The ore having become so refractory that no profitable recovery could be made with the plant in its then existing form, it was closed down on 6th December for alterations recommended by the company's metallurgical advisers as a result of experiments made by them, the chief alteration being the installation of a sands and slimes concentrating plant, by means of which a profitable recovery of 72·5 per cent. is anticipated on the refractory ore. The alterations were taken in hand at once on closing down the mill, and will be completed in the beginning of March, 1914, when the mill will re-start. Development is being pushed during this period, and satisfactory ore is being exposed.

Swaziland Tin, Ltd.—331·951 long tons of tin concentrate were produced during the year ending 31st December, 1913, at an estimated profit of £23,766, as against a profit of £14,619 for the previous twelve months. The installation of electrically-driven gravel pumps outlined in my last annual report was completed in July last, and has proved highly satisfactory, the effect being reflected in a steady increase in the amount of ground cut, and in the output of concentrate produced each month.

Marico Zinc Mines.—Development was suspended during the year pending the erection of a plant. Tenders for this have been received, but no order will be placed until a sufficient water supply is assured. Prospecting on another deposit in the immediate neighbourhood has been continued, with encouraging results. Five farms in the neighbourhood held under option have been relinquished after a careful prospecting examination.

General.—In addition to the work outlined above, a number of the company's farms, and properties offered to the company, have been examined; and, although nothing of value has been disclosed, the examinations carried out have given valuable data for future exploration. The prevalence of refractory ores in this country has made much research work necessary with a view to obtaining cheap methods of extraction, so as to convert known unprofitable refractory ore bodies into profitable propositions. Our knowledge in this respect has been increased, and continued work in this direction may materially assist our mining industry.

THE YEAR WITH THE GROENFONTEIN TIN MINE.

Details of Output, Profit and Development.

The following are the details of the operations at the mine for the year:—Mining, 943 feet; development, 1,864 feet; prospecting, 777 feet; total footage, 3,584 feet. The tonnage mined during the year was 12,675 tons. Milling and concentrating (tons of 2,000 lbs.): Number of stamps in operation, 5; running time (5 stamp basis), 254 days; mine ore treated, 5,707 tons; ore treated from Roodepoort Tributing Lease, 914 tons; total tons milled, 6,621 tons; accumulated sands re-treated, 250 tons; accumulated slimes re-treated, 4,566 tons; total accumulations re-treated, 4,816 tons; total treated all sources, 11,437 tons; total concentrate produced, 342·72 tons; average grade in metallic tin, 70·5 per cent.; alluvial concentrate produced, 53·76 tons; average grade in metallic tin, 73·4 per cent.; grand total of concentrates produced, 396·48 tons; average grade in metallic tin, 70·88 per cent. The output was 396·48 tons of 70·88 per cent. concentrate during 1913 as compared with 317·52 tons of 71·57 per cent. concentrate during 1912. The profit was £3,509 6s. 10d. for 1913 as against £9,704 3s. 6d. for 1912, but abnormal expenditure in connection with diamond drilling, valley alluvial, and other prospecting work, alterations to plant, etc., during 1913, amounted to £6,361. The ore reserve, however, which at the end of 1912 amounted to 55 tons containing 5·5 short tons of 70 per cent. concentrate, has been increased to 92 tons containing 39·51 short tons of 70 per cent. concentrate at the end of 1913. In his annual report the consulting engineer, Mr. J. J. Garrard, writes:—

> The main tin producers during the year have been a group of workings known as the Giant Workings, the outcrops of which were exposed by hydraulicing operations in June. These workings produced up to the end of the year ore containing 253 tons of 70 per cent. concentrate, with good ore still showing in the various faces. These ore bodies are irregular impregnations of rich ore, the grade exceeding 40 per cent. metallic tin. They appear to be replacements of the original granite, along lines of weakness, by mineral-bearing gases emanating from a strongly defined fissure. This fissure was previously encountered in No. 19 working, from which a raise on the fissure was stopped within 12 feet of one of the ore bodies in the Giant Workings, there being no indications of tin in the face. This illustrates the difficulties of development, and at the same time the possibilities of striking large deposits in proximity to these fissures, even where there is little or no indication to follow. Development during the year has been concentrated at the No. 3 incline, where 737 feet have been sunk and driven, and L shaft, where 286 feet have been sunk and driven. No. 3 incline was sunk on the main pegmatite vein, and connected by drifts with No. 19 and No. 23 workings. L shaft was sunk on a borehole showing indications of tin at 65 feet, and connected by drifts with No. 1 White Quartz and No. 12 workings. The object of all this work has been the intersection of fissures from which further development could be started. Several fissures containing indications of tin have been located and will be opened up as soon as the labour supply becomes normal. Mining operations generally have been seriously hampered during the last quarter of the year owing to an acute shortage of native labour, and all exploratory work had to be stopped in order to employ sufficient labour on mining ore for the mill. Large reciprocating rock drills proved of great assistance in accelerating the work of development. Hydraulicing operations in connection with the stripping of overburden on the top of the hill were carried on until 7th October, when it became necessary to shut down until 14th November owing to a shortage of water. The total tonnage of concentrate produced from the sluicing of the overburden amounted to 53·76 tons of an average grade of 73·4 per cent. metallic tin, and it is satisfactory to note that the realisation of this concentrate covered the cost of hydraulicing, whilst, as already stated, this work was responsible for laying bare a series of ore bodies which up to the end of the year had already contributed ore containing 263 tons of 70 per cent. concentrate. It is gratifying to be able to report that the hydraulicing scheme outlined in my annual report for the year 1909 has now been successful in enabling the overburden to be stripped and the granite laid bare at a cost covered by the alluvial tin recovered in the operation, instead of, as was formerly the case, when working with hand labour, at a cost of from £400 to £500 per month. It is also important to note that these operations have, as I had expected, at the same time resulted in laying bare valuable deposits of ore. A further series of diamond drill boreholes was put down during the year at a cost of £1,372, and tin was located in one hole to the dip of No. 1 White Quartz workings. The ore body has since been connected with these workings and is being opened up. During the year various alterations have been made with the object of centralising the generation of all power at the central power station. This has now been accomplished, so that all permanent machinery is now being driven electrically by the 360 h.p. Premier gas engine and bituminous gas plant. The cost of these alterations was £877, but the resultant saving in power costs has been £150 per month. This central power plant, erected primarily to furnish power for pumping water for the hydraulicing plant, has again proved of great service in keeping the mill supplied with water, as the former mill water supply again failed owing to drought. An Empire drill was used to put down a number of boreholes in the Zaaiplaats Valley, which proved the existence of a considerable extent of tin-bearing gravel lying beneath from 30 to 55 feet of almost barren overburden. Owing to the bouldery nature of the wash, however, it was impossible to arrive at an accurate estimate of its tin contents, and a vertical and an incline shaft were put down to ascertain the nature and value of the lower washes. Bedrock was struck at a vertical depth of 72 feet, but the acute shortage of native labour necessitated the temporary suspension of the work. Generally speaking, this mine is now looking better than it has done at any time during the last two years, but the uncertainty of these tin deposits makes any forecast as to the future quite impossible. The net results of the operations at this mine since its discovery in 1907 up to the end of 1913 are that the total profits made have amounted to £145,134 for a total capital expenditure (including plantation, £1,773) of £64,314, equivalent to approximately 225 per cent. on the outlay. This property has thus produced a total net profit of £80,820 after repaying its capital, and possesses a valuable plant in good condition as an asset.

Blaauwbosch Diamonds.

The March washing returns were:—Loads of tailings washed, 12,265; carats found, 1,713; loads of reef hauled, 10,764.

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THE UNIFICATION OF THE RAND MINING INDUSTRY.

Important Pronouncements by Mr. R. W. Schumacher and Mr. G. Nathan—Mr. Schumacher's Full Statement—Idea Attractive and Unassailable in Theory, but Impracticable—Effect of the Labour Factor—Mr. Nathan's Criticism of the Present System and Statement of the Case for a General Amalgamation.

STATEMENTS on the question mainly of a general scheme of amalgamation of the Rand gold mines were made before the Dominions Royal Commission on Monday by Mr. R. W. Schumacher and Mr. George Nathan.

Mr. Schumacher handed in a memorandum of his views, in which he stated: I am chairman of the Rand Mines, Ltd., and also a director of the Central Mining and Investment Corporation, Ltd. These two corporations guide the policy of a large number of gold mining companies on the Witwatersrand fields. During the year 1913 the gold mining companies which belong to our group paid in dividends £4,074,096—equal to 49·7 per cent. of the dividends paid by all the gold mines of the Witwatersrand. During the same period the gold mines that constitute our group crushed 8,444,480 tons, equal to 32·9 per cent. of the total tonnage crushed on the entire fields. I append details. I have been asked to make a definite pronouncement on the subject of a general amalgamation of all the Witwatersrand gold mining companies, which has already been discussed before your Commission. This question was first raised seriously about three years ago. The chief arguments brought forward in favour of the idea were:—

1. That the recruiting of native labour in South African territories would be simplified and cheapened. (Note.—At that time various mining groups were competing against each other within the Union of South Africa.)

2. That the investor would have better security as a shareholder in one great mining concern than as a shareholder in a comparatively small unit, where fluctuations and disappointments were more likely to occur.

3. That during the periods of shortage of native labour, which it was believed would be continuous, chronic and often severe, all available labour could be used to far greater advantage than it was used then or is used now. In other words, it was indicated that under one big amalgamation scheme the natural policy would be to concentrate labour on mines where reasonable profits could be obtained, and to close down the poor mines where labour was being employed, perhaps in large quantities, but with little or no profit. In this way no labour would be wasted, the gold output and dividends would be increased considerably, and investment in the Witwatersrand gold industry rendered much more attractive. The poor mines would be worked at some later date when the cost of exploitation would be reduced and the margin of profit greater than to-day.

ATTRACTIVE IN THEORY.

The idea is certainly an attractive one, and in theory it appears to be almost unassailable. It was of interest to me to hear Mr. R. N. Kotzé, the Government Mining Engineer, state to your Commission on the 2nd inst., in reply to a question, that he considered the amalgamation of the whole Rand to be certainly in the interests of shareholders, to be an advantage industrially to the country, and to be likely to lead to more contentment among workmen. The members of our firm gave the matter due consideration when it was first raised; but we at once came to the conclusion that it would be most inadvisable for us to attempt to put the theory into practice. We had only a few years before effected a number of amalgamations of an important and even epoch making nature, and we were determined to await the results of these amalgamations, about which we were most hopeful, before again allowing everything to be thrown into the melting-pot. The factor which, however, weighed chiefly with us then, as it does now, was that the carrying into effect of one big amalgamation scheme, which might involve the closing down of a large number of poor mines, would create a great upheaval here, the consequences of which it was impossible to foresee. Leaving on one side the question as to whether it would be possible for the various mining houses to come to terms, or whether the shareholders in the companies would be likely to agree, both of which we believe might be possible, we decided that we could not encourage the idea of an amalgamation of the whole of the Rand. It is well to add here that the first reason quoted in favour of effecting a general amalgamation has fallen away. All the mining groups, with one exception. have for some time combined and formed a joint Native Recruiting Corporation for all native labour within the Union of South Africa. As long as this corporation is well managed, we can see no reason why it should not continue its existence, though it was originally formed for only five years. It must be admitted that the third and most powerful argument quoted—namely, the desirability of wasting no native labour on poor mines, and of concentrating all on the richer ones—is likely to become weakened as greater efficiency is obtained from the natives; and there is no doubt that greater effciency will be obtained. The argument rests, as I have explaned, on an assumed perpetual shortage of native labour; but obviously, if the efficiency of the labour is improved, the shortage, ipso facto, is reduced unless other factors are introduced.

SUCCESS OF MACHINE DRILLS.

In connection with the use of machine drills, I append a quotation from the speech made by Mr. R. C. Warriner at the annual meeting of the Association of Mine Managers on February 21, 1913, in which he indicates that at that date a saving of 30 700 boys might have been effected were machine drills being used universally and exclusively, even with a low average duty, instead of hammer boys. These figures apply approximately also to-day. Allowing for the fact that it may be impossible to use machine drills to advantage in a few mines, it is clear that the further introduction of machine drills, and notably small machine drills, is bound to effect very appreciable savings in the numbers of natives required. The figure quoted above indicates that a general introduction of machine drills would alone make up for something like half the total deficiency of native labour of the entire fields. To-day machine drills are being used almost exclusively in many mines, and the tendency is to use them on an ever-increasing scale on other mines. I append also an extract from a letter from Mr. A. J. Brett, manager of the Crown Mines, Ltd., addressed to the consulting engineer, and dated November 14, 1913, in which he points out that four years after the amalgamation programme had been carried out the monthly mine tonnage had been increased by nearly 62,500 tons with exactly the same number of natives working, "that is to say, we have produced the mine tonnage of, say, the Nourse Mines without drawing on the available supply for a single boy." I give the further instance of the New Modderfontein mine, which can to-day supply 52,000 tons monthly to the mill with about 900 natives less than it could about a year ago, owing to the largely increased use of machine drills, and to the carefully thought-out system on which the underground workings have been laid out. I do not contend that all mines could afford to spend the money to achieve similar results. I am merely indicating what can be done, and what, I think, will be done in the majority of cases.

MR. GEORGE NATHAN'S STATEMENT.

Mr. George Nathan, managing director of the General Mining and Finance Corporation, Ltd., who told the Commission, in answer to the first question that he had 22 years of mining experience on the Rand, put in the following statement on the amalgamation proposals:—

At your request I beg to submit hereunder my ideas with regard to the present system of working the mines of the Witwatersrand, and the best way in which a lasting improvement could be effected, i.e., by a general amalgamation. Since the beginning of the exploration of the gold-bearing strata of the Witwatersrand, it has been the custom to work smaller or larger claim areas through individual companies, which, though separate units, were controlled by the mining houses, who formed these units into groups of administration. In the course of time the disadvantage of these methods to everybody concerned has manifested itself in so many directions that it would appear desirable to overcome so inefficient system. The first attempts in this direction were made by amalgamating two or three separate companies, and in recent years by the fusion of larger numbers. The only method, however, of bringing about a basis of operation satisfactory to all concerned—shareholders, workmen and country—viz., a general amalgamation of all the existing companies, has not been adopted, for reasons which in my opinion are either based on a lack of understanding of the position which would be created by such fusion, or which are absolutely outside the question of the economic working of these mines, i.e., political party reasons. I do not propose to go further into details as to why the idea of a general amalgamation has not been carried into effect, but with your permission I will attempt to show the disadvantages of the present system, and the advantages which would obtain under the new system after amalgamation. I think for this purpose it will be best to begin with the administration of the mines. This has to be divided into two sections, that on the individual mines and that in the head offices. On each of the mines to-day there is a mine office, with its own staff, and although the individual concerns work to a certain degree under the direction of the head offices of the respective controlling groups, they do not operate on a general basis, but each tries to get small advantages over the other, which I have no hesitation in saying leads to unnecessary expenditure and inefficiency. It must be borne in mind that under the direct control of these mine offices comes the administration of native compounds, and what I have just stated with regard to unnecessary expenditure and inefficiency certainly applies to these compounds also, the amount involved being very great when the large number of native employees is taken into consideration.

WASTEFUL MANAGEMENT.

Now I come to the head offices. Each group has its head offices in Johannesburg, and I think most or all of them have also offices in London and Paris, and some in Berlin as well. In the Johannesburg offices are a larger number of departments, each dealing with separate details of the administration of the mines, and naturally each of these offices requires its own staff, with all the attendant expenditure. Moreover, the very heads of these offices unfortunately look at the mining industry, not as a whole, but almost invariably from the point of view of the special interests of the mines under their own particular control, the upshot being that no common policy for the working of the mines is pursued, and that in order to gain minor or temporary advantages the industry as a whole, and with it of course everybody concerned therein, is made to suffer largely. Apart from the Chamber of Mines, the Executive of which consists of representatives of the various groups, and which is supposed to deal with the administration of the whole of the industry, there also exists the Groups Committee, whose *raison d'être* I personally have never been able to make out, but which I am always told is of very great advantage in connection with the control of the mining industry—a view which I am sorry to say I cannot accept—and there are further a Consulting Engineers' Committee, a Mine Managers' Association, the Witwatersrand Native Labour Association, and last, but not least, the Native Recruiting Corporation. All these different bodies, instead of working harmoniously together, somehow or other, through jealousy or I know not what reasons, seem to manage to pull against each other, and the result naturally cannot be a good one. Now, if a general amalgamation were brought about, all these separate organisations would be thrown together, they would be very largely reduced in *personnel*, and they would have at their head one chairman, with the consequence that either unanimity would be brought about or the minority would be ruled by the majority, and a common, far-sighted policy would be inaugurated for the whole of the Witwatersrand, the beneficial effects of which on the working of the mines nobody can reasonably doubt. So far as the Witwatersrand Native Labour Association and the Native Recruiting Corporation are concerned, I shall refer to these later.

DISADVANTAGES TO WORKMEN.

I now propose to deal with the disadvantages the present system involves for the workmen. To-day there is competition everywhere for white labour as well as black, and although through the existence of the W.N.L.A. and the N.R.C. the competition for native labour has been somewhat limited, it goes on nevertheless in certain directions. The consequence of this is not to the benefit of the workmen, and does not conduce to the earning of steady wages, but rather—especially as regards the white men—induce them to roam about all over the Rand, in the hope of extracting a big cheque on the "other mine," and after having tried, and very often failed, to achieve this object on that "other mine," they again move on to another property. What is the consequence of this? It seems obvious that it must lead to inefficiency, because, apart from the fact that no sooner has a workman become reasonably acquainted with his working place in one mine than he leaves and has to start anew in unfamiliar surroundings; he also loses the interest which he would naturally feel for a particular mine if his employment in that mine were of long duration; and although I believe we have very many honest workmen on these fields who have no intention of working below their capacity, it is only human that under the circumstances they should involuntarily slide into slackness. This slackness of course reacts on them as far as their pay is concerned, but it has also other serious consequences. It is often the cause of accidents, attended in many cases by loss of life, and it also results in neglect of the precautions for maintaining proper health conditions, underground as well as on the surface. Then again this competition for labour is carried on by mines which are struggling for their very existence. The latter absorb large quantities of labour which could, to the greater advantage of the labourers themselves and of the industry in general, be employed in other and richer sections, until as efficiency increased these poor mines could be worked at a larger profit, with benefit to all. I am also convinced that the competition for labour so far as the natives are concerned has conduced to the continuation of the system of recruiting so distasteful to the native himself, and certainly not less distasteful to the employer. The recruiters have taken advantage of the position, and in my opinion have succeeded on various occasions in making the employers believe in the necessity for continuing the evil, under the threat that the natives will not come to work unless they receive, before leaving their kraals, an advance to supply their families with necessities of life. Now, I am strongly of the opinion that this custom of advancing a labourer money before he has even started work (and I make bold to say that very often he will not commence work as soon as he would have done had he not received an advance) is economically most unsound, and must lead to discontent amongst those to whom the advances are made. I maintain that if a general amalgamation were brought about, and the industry were in a position as a whole to make the Witwatersrand more attractive to natives, the latter would come voluntarily to work, and the monstrous expenditure in connection with this loathful recruiting system would be saved. I am quite prepared to admit that years ago it was necessary to recruit natives for work on these fields, because they were not then acquainted with the mines, but since then they have travelled to and fro in such large numbers that no other advertisement is needed than the native going back to his kraal and expressing satisfaction with his stay here.

THE LABOUR PROBLEM.

The next point I propose to discuss is the working of the mines. To-day labour is scattered all over the fields, and except at a few of the larger properties it is impossible to concentrate work in such a manner as to obtain the best results. After a general combination this could be easily effected, and without fear of contradiction I state that a large reduction in working costs could be brought about without reducing the existing scale of wages. It naturally follows that when concentrating work in the manner I have in mind, a much greater proportion of mechanical appliances would be used, and obviously if the same quantity of rock were then broken, it could be done with a lesser number of employees; but it must not be forgotten that, in consequence of the lower working costs then obtaining, ore which cannot be profitably worked to-day will be brought within the limit of payability, and I have no doubt that the larger scale of operations would much more than make up for the loss of employment resulting from improved efficiency. There is another very serious aspect to the working of the mines individually. To-day there are some properties which undoubtedly have so many working faces at their disposal that they could easily crush larger tonnages provided they had a sufficient labour force, but, this not being available, some of the faces have perforce to remain unworked, whereas in other mines the number of faces available is inadequate, and double shifts are resorted to in order to make up for the deficiency. I need not say that from a health point of view the double shift system is undesirable, and I think I am right in stating that from the financial aspect also it is unsound. Were an amalgamation brought about, this state of affairs would at once cease to exist, and single shift could be introduced all over the Rand, with its undoubted advantages, especially to the working men. Speaking of the financial side, there is in my opinion a certain amount of so-called capital expenditure incurred which could be avoided if the existing workings, plant and machinery could be made the best use of for the whole of the mines, instead of, as under prevailing conditions, serving individual mines only. I have endeavoured to show in the foregoing the disadvantages of the present arrangement vis-a-vis the advantages of a general amalgamation, but unfortunately, owing to lack of time, I have not been able to go into details as fully as I would have liked. If, however, you desire me to supply such details at a later date, I shall have great pleasure in preparing them. In the meantime, I will shortly recapitulate my arguments in favour of a general amalgamation, and will divide the benefits to be derived therefrom into three classes: (1) Those accruing to the working man; (2) those accruing to shareholders; (3) those accruing to the community of the Witwatersrand and to South Africa as a whole.

(1) Although on the face of my proposals it might appear that the number of white men employed would be reduced, I maintain that the reverse would actually be the case. Wherever a reduction would be brought about through better efficiency, an increase greater than that necessary to equalise this would take place in consequence of lower grade ore coming under attack, so that in my opinion this fear can be dismissed. On the other hand, a combination of the mines would undoubtedly have the effect of giving the workmen steadier employment, more regular wages, and, as larger amounts of money for welfare work would be available, better health and living conditions, which could not fail to lead to the contentment which is so sorely lacking here.

ELIMINATING SPECULATION.

(2) The shareholder would see eliminated the more or less speculative element attaching to his holdings to-day, inasmuch as the chances of the grade in the particular mine in which he is at present interested falling off would be minimised or almost totally removed by the fact that, as experience has shown, reductions of value at one point are to a large extent compensated for by increases at another; consequently his investment would be in a concern of much greater stability, while at the same time embracing all the possibilities of this great mining field. He would also benefit by the increase of profits resulting from concentration and improved efficiency, and although, as I will state later, I would not propose to distribute the whole of the profits to shareholders, I think I am not too optimistic if I predict that larger distributions would be made to them than will be possible in the future under a continuance of the present arrangements.

(3) I have often heard it argued that the mercantile community would greatly suffer by a general amalgamation, inasmuch as the combined concern would then be inclined to deal direct with producers, instead of, as we are doing now, through local houses or agents. Personally, I have not the slightest fears for the mercantile community in this connection. I think it is in the interests of the administrators of the mining industry to deal with local merchants, as the economy effected by dealing direct with the manufacturers cannot outweigh the advantages of having a responsible person on the spot to negotiate with in cases where deliveries are not as expected. As a matter of fact, I think that after the amalgamation a wave of progress would come over the land, and the merchants necessarily would benefit by the attendant expansion. But it is not only the merchant we have to consider; it is South Africa as a whole; and in order that the Union should benefit, apart from the increases which would take place in profits tax, etc., I propose that after shareholders shall have received in dividends an annual amount of, say, 7 per cent. on the capital invested by them, say 25 per cent. of the remaining profits should be retained by the amalgamated concern for reinvestment in the Union of South Africa; that is to say, the money should be used for purposes such as opening up of new mines, the building of railroads, or the fostering of farming and other industries. In this manner an activity could be secured which otherwise could not easily be brought about, which would lead not only to larger revenue to the country's exchequer, but also to the employment of large numbers of additional workmen. I hope I have succeeded in the foregoing remarks in showing that there would be no reason to fear (as has been suggested to me) that the general amalgamation of the mines of the Witwatersrand would bring ruin to many people, and that I have proved that such amalgamation would benefit not only shareholders, but also the workmen and the community of the country as a whole, and that progress, which is now hampered by causes already explained by me, would then ensue to an unexpected degree.

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The Shortcomings of the Prospector in South Africa.

To the Editor, *South African Mining Journal.*

Sir,—I have read with interest " Fossicker's " letter in your issue of 4th inst. It is not my intention to reply to all the statements in that letter, but I may be permitted a few comments thereon. There is rather a hostile tone running through " Fossicker's " letter; this is unfortunate, for all that " Consulting Mining Engineer " has said can be proved up to the hilt. I am not concerned with the weaknesses of the South African prospector; we all have some; but in my opinion the trouble with the prospecting department of South African mining lies chiefly in the fact that the public has found out the painful ignorance of the prospector in regard to the very first essentials of his work and will no longer pay for a few petty but valueless specimens and a lot of wild theories. During the past eight years I have met many prospectors, but found few who could give an intelligible description of the properties they were working on; their acquaintance with the simple determination of minerals was meagre, and their geological ideas were weird. " Fossicker " talks of the sixth sense; there is something in that, but unless that sense is backed up by such training as will enable sound deductions to be drawn, that sense becomes of little practical value. A controversy similar to this is going on in other parts of the world, and the general opinion is that the rule of thumb man has had his day. Gold or other reefs are no longer found by the prospector barking his shins against it. The day of the technically-trained prospector has arrived and " Fossicker " and his friends should realise now that they have a better chance of getting to Heaven than of getting money from the public, although there are still plenty of fools. In the course of my wanderings I have met altogether about thirty so-called prospectors. Most of them knew either about the Rand or the Premier Mine long before the actual discovery. Were this true it only serves to show the incapacity of these men. Out of that thirty, I only found two who were competent. These two had a sound knowledge of geology, mineralogy and the determination of minerals, were capable of sampling a prospect or mine in a proper manner, and if means were available could make either a fire or chemical assay, in addition to writing an intelligent report for their employers and their technical advisers. On learning the capabilities of these men, which I did by degrees only, for they are not talkers, I thought that at last the right men were coming into the field, but they are now engaged in responsible technical work on the Reef and their reasons for giving up the veld life after many years' experience are much on the lines of " Consulting Mining Engineer's " comments: these men found they were being placed in the same category, which is objectionable. Further, if " Fossicker " wants to know what has happened to the others, he will find one shunting railway trucks, another selling sixpenny beers, and another at a barber's chair, and so on, throughout the country. I write this in no hostile spirit; my contention is that the untrained, so-called practical, man has had his day and should prospecting revive in South Africa it will be trained men, such as the two I have mentioned, who will get the work and not the mere " fossicker." In another country I have seen middle-aged prospectors studying at technical schools during the winter months; here, of course, winter is the prospecting time proper, at least for a large part of the country, but I have only on a very few occasions seen the prospector on the veld try to improve his knowledge, but cheap novels are abundant. I am leaving shortly for another part of the world, where I will have to rub shoulders with prospectors, and it will be interesting to compare the standard of intelligence there with what I have observed here. It appears to me that locally the syndicate monger is largely responsible for the creation of a certain type of prospector and self-styled " expert," and it will be a good thing when the lot are wiped out.—Yours, etc.,

ANOTHER FOSSICKER.

Johannesburg, 8th April, 1914.

POSITION AND PROGRESS OF THE SHEBA.

Developments in the Intombi and Zwartkopje Mines—Work Being Pushed On.

THE following information has been received, *inter alia*, from the general manager of the Sheba, Mr. H. B. White, for the six months ended 31st December:—During the period under review, ore has been extracted and sent to the mill from the mines as follows: Zwartzkopje, 34,053 tons, value 14·46 dwts. per ton; Intombi, 2,302 tons, value 13·74 dwts. per ton; total, 36,355 tons, value 14·10 dwts. per ton. Footage: Zwartzkopje, 2,031 feet; Intombi, 1,573 feet; total, 3,604 feet. This represents 46 per cent. more footage than was done during the corresponding period last year. Generating Station at River.—The power available here has only been sufficient to supply the power required at the cyanide works, workshops, lights, and ten of the fifty-five electrically-driven stamps. New Steam Generating Station at Avoca.—Work on this has been proceeding satisfactorily, and this plant will soon be available for use. Zwartzkopje Shaft.—Considerable repairs had to be undertaken on and below the collar of this shaft, which were carried out without any stoppage affecting the outputs. A 100 horse power boiler is being transferred from the mill to the shaft to ensure an adequate supply of steam for all purposes. Electric cables have been laid down from the cyanide works to the shaft to supply power for pumping and ventilating purposes. A pumping station has been cut on No. 7 level, where an electric pump is being installed. Machinery and plant have been maintained in good running order.

The Consulting Engineer, Mr. G. C. Fox, visited the property during January, and reported as follows:—Ore Reserves.—I have carefully gone into the matter of ore reserves with Mr. White, and am satisfied that the tonnage returned is fair and reasonable. The details are as follows: Zwartzkopje, 60,000 tons, value 12 to 15 dwts. per ton; Intombi, 30,000 tons, value 12 dwts. per ton; Insimbi, 15,000 tons, value, 7 to 8 dwts. per ton; Southern Cross, 5,000 tons, value 10 to 12 dwts. per ton; total, 110,000 tons. Zwartzkopje.—No further payable bodies have been exposed on the eighth level so far, but development will be carried on when circumstances permit. The payable values reported a short time ago on the ninth level only lasted for a few feet; further exploratory work will be done in the vicinity. The development results on the eighth and ninth levels during the past six months have been somewhat disappointing, but there is every reason to believe that further development will yet reveal additional bodies of payable ore. Zwartzkopje Shaft.—The concrete work in connection with the collar of this shaft is practically completed, and most of the new timber sets have been placed in position. The work has been carried out in a highly satisfactory manner, and no further trouble need be anticipated on this account during the life of the mine. Intombi.—The values obtained latterly on the third, fifth, sixth and seventh levels have been somewhat erratic, and it appears probable that the western limit of the payable shoot is being reached. It is satisfactory to note, however, that the width of the shoot appears to be well maintained on the lower levels and that the average value continues satisfactory. Margaret.—Within the last two or three weeks a little prospecting work has been done in the old workings of this mine, and it appears possible that some further ore bodies of a payable nature may be opened up. Electric Power Station.—I regret to say that the completion of this plant has been considerably delayed on account of the dislocation of railway communication. I understand that the bulk of the electric appliances have now been delivered on the property, and hope that no further delays will occur.

Rhodesian Section.

LATEST MINING NEWS.

Chamber of Mines Report—Wanderer Company's Returns—The Pickstone—Tati Concessions.

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of February contains the following:—Finance: Receipts during the month amounted to £119 0s. 3d., and payments to £112 12s. 2d. The balance to credit of current account on 28th February was £418 3s. 9d. Fixed deposits totalled £700. Native labour: The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of December, 1913, and January, 1914:—

	December, 1913.	January, 1914.
Local	9,690	9,518
Portuguese territory	6,490	6,814
N.W. Rhodesia	3,724	3,934
N.E. Rhodesia	5,527	5,724
Nyasaland	6,847	7,277
Other Sources	920	953
	33,198	34,220

The number employed in January, 1914, shows an increase of 2,799 as compared with the same month of 1913. The increase is due to increased supplies from Portuguese territory, N.W. Rhodesia, and Nyasaland.

* * * *

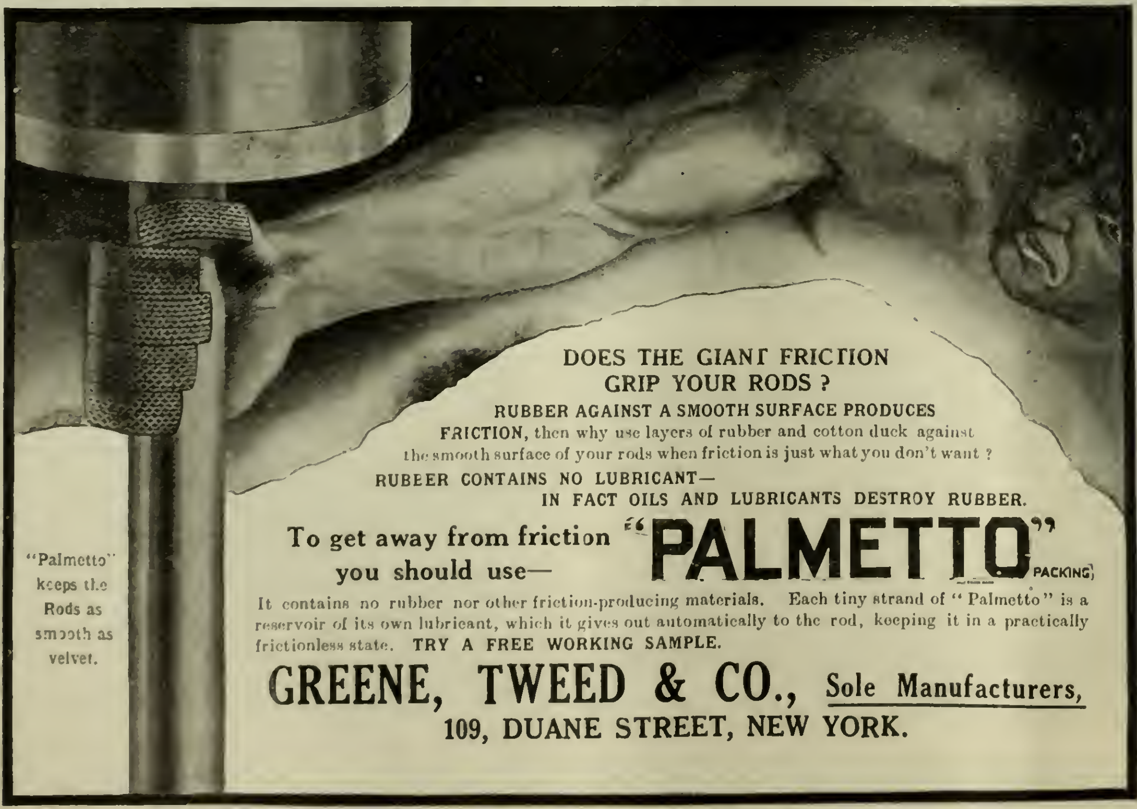
At the Wanderer Mine, in February, the value of the output was £6,167; while the total working expenses, including development expenses, were £3,290. The manager also reports an additional profit of £206 from the treatment of ore from outside sources, making the total profit £3,083. The above expenses do not include any charge for depreciation, or for London Administration.

* * * *

The manager's report on operations at the Pickstone Mine for the month of February states that the total footage accomplished during the month, on the Pickstone No. 1 east and on the Pickstone No. 1 west, amounted to 637 ft. The gold recovery was 664 ozs. from the mill and 188 ozs. by cyanide. Pickstone West main vertical shaft—" I have to report that during last week the north lode of the Ironstone Reef was intersected by the crosscut at the 200 ft. level, showing an assay value of 8½ dwts. over 5 ft."

* * * *

An extraordinary general meeting of the Tati Concessions, Limited, was held in mail week at the company's offices, 18, St. Swithin's Lane, E.C., to confirm resolutions providing for the voluntary winding up of the undertaking with a view to its reconstruction. Mr. A. Dodds Fairbairn presided, and, in moving the adoption of the resolutions, mentioned that the Board had received proxies in favour of the reconstruction scheme representing 189,361 shares. Mr. G. B. Tydd seconded the motion, and the resolutions were carried unanimously.



DOES THE GIANT FRICTION
GRIP YOUR RODS ?
RUBBER AGAINST A SMOOTH SURFACE PRODUCES FRICTION, then why use layers of rubber and cotton duck against the smooth surface of your rods when friction is just what you don't want ?
RUBBEER CONTAINS NO LUBRICANT—
IN FACT OILS AND LUBRICANTS DESTROY RUBBER.

"Palmetto" keeps the Rods as smooth as velvet.

To get away from friction you should use— "PALMETTO" PACKING

It contains no rubber nor other friction-producing materials. Each tiny strand of "Palmetto" is a reservoir of its own lubricant, which it gives out automatically to the rod, keeping it in a practically frictionless state. TRY A FREE WORKING SAMPLE.

GREENE, TWEED & CO., Sole Manufacturers,
109, DUANE STREET, NEW YORK.

CARRIED IN STOCK BY BARTLE & Co., Ltd., Johannesburg; E. W. TARRY & Co., Ltd., Kimberley.

MACHINERY AND MOTOR CARS AT THE AGRICULTURAL SHOW

Full List of Important Exhibitors in the Agricultural Machinery and Automobile Sections.

The following is a list of the firms exhibiting agricultural machinery and implements at the forthcoming Rand Agricultural Show:—

- United Engineering Co., Ltd.
- Vereeniging Brick and Tile Co., Ltd.
- Rawbone & Co. (Thos. Walker).
- Wolff & Elias.
- Whyte & Co. (Thatcher & Co.).
- Agricultural Supplies Association.
- Andrew Thienhaus, Ltd.
- Bourne & Co. (Singer's Sewing Machines).
- Beckett & Co.
- Bellamy & Lambie.
- Bradlow, A. R., & Co.
- Bam, Wm., & Co.
- Blackhurst, E., & Co.
- Bartle & Co.
- Blane & Co.
- L. Busse (Blacksmith).
- Clarke Bros. & Brown.
- Carter & Co., London (T. C. Elliott).
- Hirsch, Loubser & Co.
- Henwood, Son, Soutter & Co.
- Hannam & Bonsall.
- Malcomess & Co.
- North, Geo., & Co.
- Orenstein-Koppel & Co.
- Parker, Wood & Co.
- Robey & Co., S.A., Ltd.
- Randles, Bro. & Hudson.
- Stewarts & Lloyds.
- Wevell Bros.
- Hockley & Co.
- Fraser & Chalmers.

MOTOR SECTION.

The following is a list of exhibitors in the commercial vehicle section of the Agricultural Show:—

- D. H. Saker & Co.
- Connock's Garage.
- Bartle & Co.
- International Harvester Co.
- Motor Wagon Agency.
- J. P. Matthews.
- B. J. Penney.

In the motor car section proper the following are exhibiting:—

- Dunlop Pneumatic Tyre Co., Ltd.
- S.A. Motor Industries.
- Goldfields Garage.
- T. B. Adair.
- Johannesburg Vulcanizing Works.
- P. Seymour Fox.
- Strange Bros.
- H. Gill & Co.
- Shimwell Bros.
- D. H. Saker & Co.
- Hoare's Motor Supplies.
- Continental Tyre Company, Ltd.
- Connock's Garage.
- Bartle & Co., Ltd.
- Rand Garage.
- Standard Motor Works.
- B. J. Penney.
- Rudge-Whitworth, Ltd.
- Automobiles Ltd.
- Johannesburg Motor Mart.
- J. MacG. Love.
- Reed Bros.' Garage.
- C. F. Wienand.

Legal Decisions Affecting Mining.

The hearing of the case of the Consolidated Langlaagte Mines, Ltd., vs. the Victoria Falls and Transvaal Power Company, Ltd., in which the plaintiff company claims £42,000 as damages for breach by the defendant company of a contract to supply a certain amount of electric power, was concluded this week. Mr. Stratford, K.C. (with him Mr. MacWilliam) concluded his argument on behalf of the plaintiff, and Mr. Esselen, K.C., and Mr. Feetham replied for the defendant. His Lordship reserved judgment.

In the case of Johann Ludwig Gauf vs. Apex Mines, Ltd., the plaintiff, a prospector, residing in Johannesburg, claims a declaration that he is entitled to an undivided half-interest with the defendant company in 60 claims on the farm Rietfontein, or, in the alternative, 30 claims, or their value, £30,000, on a quantum meruit. The plaintiff alleges that under an agreement in writing, dated March 28, 1893, in consideration of his pointing out to one Boucher, the defendant company's consulting engineer, the outcrop of the Main Reef series on the farm Rietfontein, the property of the defendant company, and on the condition that Boucher should decide that such outcrop or outcrops were sufficiently worth prospecting upon, it was agreed that the defendant company should—(a) grant the plaintiff a first vergunning of 12 claims, five deep (60 claims in all), after the company's mynpacht and owners' claims had been marked off, on condition of the company retaining an undivided half-share or interest therein; (b) that the company should have the eventual right of floating such 60 claims; (c) that the plaintiff should pay half of the licences thereon. The plaintiff alleges that he pointed out the outcrop of the Main Reef series on the farm to Boucher. and that the latter decided that such outcrop was sufficiently worth prospecting upon; that thereafter the defendant company did prospect upon the outcrop, and had fully located the Main Reef series underlying the outcrop, and, on or about November 23, 1909, acquired 87·05 discoverer's claims on the outcrop and Main Reef series on the farm; that on or about March 22, 1912, the company, in terms of the Precious and Base Metals Act of 1908, under which the farm was proclaimed on December 2, 1912, acquired a mynpacht, in extent 686 morgen 587 square roods, on the outcrop, but no owners' claims were marked off, as the same no longer accrue to the owner under the said Act; that since the passing of the said Act the owner's right to grant vergunning claims no longer exists. By reason of the above, the plaintiff formulates his claim as stated, which the defendant refused to grant, and denied that the plaintiff was entitled to any remuneration for his services whatsoever. The defendant company, in its plea, denies all the allegations made by the plaintiff, except that it admits that it acquired 87·05 discoverers' claims on the farm Rietfontein. The defendant company originally filed an exception to the plaintiff's declaration, on the ground that the same was bad in law and disclosed no cause of action. The exception was argued last year, and judgment was given on July 1, 1913, dismissing it, with costs. Mr. Stratford, K.C. (with him Mr. Adler) appears for the plaintiff; and Mr. Esselen, K.C. (with him Mr. Taylor) for the defendant. Counsel opened the case, and the further hearing was postponed to April 14.

Apple Growing in Tasmania.

Orcharding in Tasmania is a long-proved investment, giving a net return of about £35 per acre—equal to 50 per cent. per annum on capital invested—when orchard is in full bearing. Owing to the fine climate, lovely scenery and pleasant social conditions, it is particularly suitable for those contemplating retiring from mining work. We plant and manage for absentee owners, with extended payments, under Government expert supervision. We are managing for over 40 absentee owners, many of whom have visited Tasmania and have personally investigated the industry and our absentee system. Land situated on fine navigable waterway. Pamphlets, giving full particulars as to capital required, profits, etc., forwarded on application to our representative, Mr. J. P. Johnson (for many years on the Rand, and now settled on our Kelso Estate), who can be interviewed at the Grand National Hotel, Rissik Street, Johannesburg.—Messrs. Sadleir & Knight, Orchard Agents and Attorneys, Launceston, Tasmania.

DETAILS OF THE MARCH OUTPUT.

Increase of £257,160 Over February—Improvement in Native Labour Supply—Randfontein the Leading Producer.

On account of the tenth of the month falling on Good Friday, the gold output of the Transvaal for the month of March was declared on Thursday, April 9th; and on account of an improvement in the native labour supply and because of the longer month, the March return is substantially greater than that for February. Indeed, last month's output is the largest declaration since October last, and it is also to be observed that the numbers of native labourers employed on the mines is 162,815—the largest since July of last year. Both the Witwatersrand and the outside districts shared in the advance, the Witwatersrand output showing an increase of 60,163 ounces, and an increase in value of £255,557. The official figures of the Chamber of Mines, are as follows:—

Total output	686,801 ozs.
Value	£2,917,346
Increase	60,540 ozs.
Value	£257,160
Witwatersrand	657,708 ozs.
Value	£2,793,768
Increase	60,163 ozs.
Value	£255,557
Outside Districts	29,093 ozs.
Value	£123,578
Increase	377 ozs.
Value	£1,603
Total stamps	9,662
Increase	14
Witwatersrand	9,120
Increase	20
Outside Districts	542
Decrease	6

When the daily yield of the Witwatersrand for March is compared with that of February it is found not to be so good, for the average daily yield of February was £90,650, while that of March was £90,121—a decrease of £529 per day. The monthly yields since January of last year have been as follows:—

1913.	Ozs.	£
January	789,380	3,353,116
February	734,122	3,118,352
March	790,552	3,358,050
April	784,974	3,334,358
May	794,306	3,373,998
June	747,077	3,173,382
July	653,389	2,783,917
August	728,096	3,092,754
September	706,186	2,999,686
October	718,431	3,051,705
November	673,486	2,860,788
December	672,815	2,857,938
1914.		
January	651,753	2,768,470
February	626,261	2,660,186
March	686,801	2,917,346

The progressive outputs since the War are:—

	Ozs.	£
1901	238,994	1,104,687
1902	1,707,661	7,253,665
1903	2,955,749	12,589,248
1904	3,779,621	16,054,809
1905	4,897,221	20,802,074
1906	5,786,617	24,579,987
1907	6,451,384	27,103,738
1908	7,052,617	29,957,610
1909	7,280,545	30,925,788
1910	7,533,843	32,001,735
1911	8,237,723	34,991,620
1912	9,124,299	38,757,560
1913	8,791,860	37,358,040

THE LABOUR POSITION.

Altogether 185,824 boys were in the employ of the W.N.L.A. and contractors on the last day of the month and were distributed as follows:—On gold mines, 162,815; on coal mines, 9,619; on diamond mines, 13,390. Labour fluctuations during the last fifteen months will be well seen from the following table:—

Month.	Total Natives.	Total Labourers on Gold Mines.	Increase or Decrease on Gold Mines.
1913.			
January	222,791	200,090	+ 8,744
February	230,457	207,662	+ 7,572
March	231,783	207,733	+ 71
April	230,103	205,424	– 2,309
May	222,051	179,644	– 7,780
June	211,808	188,094	– 9,550
July	193,023	170,242	–17,852
August	180,631	158,223	–12,019
September	174,391	152,637	– 5,586
October	170,971	148,782	– 3,755
November	169,535	147,569	– 1,313
December	171,339	150,012	+ 2,443
1914.			
January	175,652	154,202	+ 4,190
February	179,447	157,673	+ 3,471
March	185,824	162,815	+ 5,142

TWELVE LEADING COMPANIES.

Randfontein is the principal producer of the month. The twelve principal producers during March are the following:

	Stamps.	Tubes.	Tons.	Value.
Randfontein Central ...	900	29	207,269	£246,589
Crown Mines	660	25	185,000	241,700
East Rand Proprietary	820	25	137,100	210,131
Ferreira Deep	255	7	57,230	111,609
New Modder	180	7	51,200	95,960
Rose Deep	300	7	68,200	86,441
Robinson	250	6	50,500	85,231
City Deep	150	9	42,000	80,881
Village Deep	180	7	52,000	70,504
New Kleinfontein ...	200	4	52,000	69,068
Brakpan	140	8	48,076	68,541
Geldenhuis Deep ...	300	7	48,000	66,367

PROFITS.

As regards profits the various controlling groups record the following figures:—

	February.	March.
Rand Mines:—		
Central Mining	£186,900	£226,713
Subsidiaries	193,133	215,372
Gold Fields group	73,453	68,389
Robinson group	55,016	85,475
East Rand Proprietary Mines ...	50,292	60,512
Kleinfontein group	20,941	23,505
Barnato group	94,055	104,704
Albu group	51,850	62,762
Neumann group	46,160	50,738
Cons. Mines Selection	16,920	19,927
Goerz group	9,614	11,193

INCREASES AND DECREASES.

The following returns of the March output have been filed with the Chamber of Mines. Increases and decreases compared with February are appended:—

The Witwatersrand.

	February.	March.	Increase.	Decrease.
	£	£	£	£
Aurora West	15,050	18,456	3.406	—
Bantjes Consolidated	24,556	28,855	4,299	—
Brakpan Mines	60,560	68,541	7,981	—
City Deep	66,418	80,881	14,463	—

	February. £	March. £	Increase. £	Decrease. £
City and Suburban	45,854	49.851	3,997	—
Consolidated Langlaagte	50,361	56.146	5,785	—
Consolidated Main Reef	27,716	31,442	3,726	—
Crown Mines	224,301	241,700	17,399	—
Durban Roodepoort Deep	26,846	31,892	5,046	—
Durban Roodepoort	14,476	15.058	582	—
East Rand Proprietary	191,458	210,131	18,673	—
Ferreira Deep	97,689	111,609	13,920	—
Geduld Proprietary	28,184	30,104	1,920	—
Geldenhuis Deep	61,074	66.367	5,293	—
Ginsberg	17,067	18.333	1,266	—
Glencairn Main Reef	13,780	15,785	2,005	—
Knight Central	25,928	24,790	—	1,138
Knights Deep	62,582	61,707	—	875
Langlaagte Estate	53,500	59,264	5,764	—
Luipaardsvlei Estate	18,180	19,786	1,606	—
May Consolidated	7,174	8,534	1,360	—
Main Reef West	23,231	24,458	1,227	—
Meyer and Charlton	32,848	34,458	1,610	—
Modderfontein B.	60,352	64.221	3,869	—
New Goch	29,709	33,170	3,461	—
New Heriot	22,296	23,923	1,627	—
New Kleinfontein	63,058	69,068	6,010	—
New Modderfontein	81,951	95,960	14,009	—
New Primrose	27,432	27,360	—	72
New Rietfontein	12,306	6.788	—	5,518
New Unified	13,822	14,633	811	—
Nourse Mines	53,301	58,360	5.059	—
Princess Estate	27,937	30,588	2.651	—
Randfontein Central	214,323	236,589	32,266	—
Robinson Deep	59,918	65,024	5,106	—
Robinson	75,911	85,231	9,320	—
Rose Deep	78,056	86,441	8,385	—
Roodepoort United	20.398	21,226	828	—
Simmer and Jack	61,877	64,026	2,149	—
Simmer Deep	40,464	39,487	—	977
Spes Bona Tribute	4,834	4,668	—	166
Van Ryn Estate	46,279	51,211	4,932	—
Van Ryn Deep	56,321	64,757	8,436	—
Village Deep	58,092	70,504	12,412	—
Village Main Reef	55,212	60,131	4,919	—
Vogelstruis Estate	12,926	14,718	1,792	—
West Rand Central	3,470	3,768	298	—
West Rand Consolidated	26,119	30,490	4,391	—
Witwatersrand	47,562	50,403	2,841	—
Witwatersrand Deep	51,631	52.995	1,364	—
Wolhuter	37,151	42,634	5,483	—
Miscellaneous producers	6,670	7,246	576	—
Outside Districts.				
Barrett	654	1,121	467	—
Ceylon Lydenburg	943	1,066	123	—
Glynn's Lydenburg	7,620	7,960	340	—
Nigel	18,919	19,034	115	—
Quest	2,927	3,160	233	—
Sheba	13,376	13,104	—	272
Sub Nigel	9,167	10,067	900	—
Transvaal G.M. Estates	37,125	41,165	4,040	—
Worcester Exploration	3,942	3,938	—	4
Miscellaneous producers	27,302	22,963	—	4,339

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

The Witwatersrand.

Company.	Tons Milled.	No. of Stamps.	Tube Mills.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	14,476	80	—	4,345	18,456
Bantjes Consolidated	24,800	100	3	6,793	28,855
Brakpan Mines	48,076	140	8	16,136	68,511
City Deep	42,000	150	9	19,041	80,881
City and Suburban	28,267	155	2	11,736	49,851
Consolidated Langlaagte	45,000	80	8	13,218	56,116
Consolidated Main Reef	20,700	100	3	7,402	31,412
Crown Mines	185,000	660	25	56,901	211.700
Durban Roodepoort	14,665	90	1	3,545	15,058
Durban Roodepoort Deep	23,730	100	3	7,508	31,892
East Rand Proprietary	137,100	820	25	49,469	210,131
Ferreira Deep	57,230	255	7	26,275	111,609
Geldenhuis Deep	48,000	300	7	15,624	66,367
Ginsberg	14,858	75	1	4,316	18,333
Glencairn Main Reef	21,192	160	—	3,716	15,785
Geduld Proprietary	19,050	50	5	7,087	30.104
Knights Deep	79,000	400	11	14,527	61,707
Knight Central	21,100	95	3	5,836	24,790
Langlaagte Estate	48,073	200	5	13,952	59,264
Luipaardsvlei Estate	18,220	60	3	4,658	19,786
Main Reef West	19,720	90	3	5,758	24,458
May Consolidated	10,010	100	—	2,000	8,534
Meyer and Charlton	14,980	75	2	8,112	34.458
Modderfontein B.	35,700	80	5	15,119	64,221
New Goch	30,000	120	4	7,809	33,170
New Heriot	13,728	70	1	5,632	23,923
New Kleinfontein	52,000	200	4	16,260	69,068
New Modderfontein	51,200	180	7	22.591	95,960
New Primrose	24,700	155	2	6,411	27,360
New Rietfontein Estate	5,953	55	—	1,598	6,788
New Unified	12,800	60	1	3,445	14 633
Nourse Mines	43,200	260	7	13,739	58,360
Princess Estate	24,000	60	5	7,201	30,588
Robinson	50,500	250	6	20,065	85,231
Robinson Deep	45,300	110	8	15,308	65,024
Randfontein Central	207,269	900	29	58,052	246,589
Roodepoort United	26.577	60	3	4,997	21,226
Rose Deep	68,200	300	7	20,350	86,441
Simmer Deep	53,700	180	9	9,296	39.487
Simmer and Jack	69,000	320	7	15,073	64,026
Spes Bona Tribute	5,000	40	—	1,099	4,068
Van Ryn Deep	39,200	75	8	15,245	64,757
Van Ryn Estate	38,940	140	6	12,056	51,211
Village Deep	52,160	180	7	16,598	70,504
Village Main Reef	32,600	220	5	14,156	60,131
Vogelstruis Estate	12,951	70	—	3,465	14,718
West Rand Central	2,303	20	1	887	3,768
West Rand Consolidated	24.000	100	4	7,478	30,490
Witwatersrand	41,570	210	4	11,866	50.403
Witwatersrand Deep	41.100	245	4	12,476	52,995
Wolhuter	34,100	120	4	10,037	42,634
Miscellaneous producers	—	—	—	—	7,246
Outside Districts.					
HEIDELBERG—					
Nigel	12,750	75	1	4,481	19,034
Sub Nigel	4,835	25	1	2,370	10,067
BARBERTON—					
Barrett	—	—	—	264	1,161
Sheba	6,670	60	—	3,085	13.104
Worcester Exploration	5,200	40	1	927	3,938
LYDENBURG—					
Ceylon Lydenburg	622	5	—	251	1,066
Glynn's Lydenburg	3,813	20	1	1,874	7.960
Transvaal G.M. Estates	14,820	75	3	9,691	41,165
KLERKSDORP—					
Quest	4,133	35	—	744	3,160
Miscellaneous producers	—	—	—	—	22,963

Barnato Group.

The following are the operations of the Barnato Group for the month of March:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.	Gross Profit including sundry Revenue.
Cons. Langlaagte ...	80	45,600	£56,145	£22,627
Ginsberg	75	14,858	18,332	4,632
Glencairn	160	21,192	15,785	3,070
New Primrose	155	24,700	27,361	12,479
New Rietfontein ...	55	5,953	6,787	847
New Unified	60	12,800	14,635	5,133
Quest	35	4,133	3,163	817
Van Ryn Deep ...	75	39,200	64,755	30,077
Witwatersrand	210	41,570	50,403	25,022
March totals ...	905	210,006	£257,366	£104,704
February totals .	945	192,884	£241,583	£94,055

Monthly gross profits: January, £87,277; February, £94,055; March, £104,704.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of March, 1914:—

	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	10,010	£8,512	£430
Princess Estate	60	5	24,000	30,500	2,510
Geduld Proprietary ...	50	5	19,050	£30,031	8,253
	210	10	53,060	£69,043	£11,193

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of March:—

Company	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	68,200	16/ 1	20,350	£30,425
Geldenhuis Deep	300	7	48,000	23 3	15,624	9,685
Nourse Mines ...	260	7	43,200	20 3	13,739	13,874
Ferreira Deep ...	255	7	57,230	17/ 2	26,275	61,039
Crown Mines ...	660	26	185,000	15 3	56,901	97,867
Durban Rood. D.	100	3	23,430	24 7	7,508	2,482
Totals & averages	1875	57	425,060	17 7	140,397	£215,372

Crown Mines, Ltd.—Decreased recovery per ton due to special clean-up January prior to strike, increased tonnage milled March from which there has not been time to recover all gold, and to fluctuations in stope values. Labour position improving and tonnage crushed being steadily increased.

The following are the results of crushing operations of Central Mining companies for the month of March:—

Company.	No. of Stamps	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	35,700	15/ 2	15,119	£36,309
New Modder. ...	180	7	51,200	15/ 6	22,591	55,134
City Deep	150	9	42,000	23/ 2	19,041	30,971
Village Deep ...	180	7	52,000	17/ 1	16,598	25,079
Village Main Reef	220	6	32,600	18/ 6	14,156	29,004
Robinson	250	6	50,500	11/ 7	20,065	47,269
Bantjes Cons. ...	100	3	24,800	20/ 7	6,793	2,947
Totals & averages	1160	43	288,800	17/ 6	114,363	£226,713

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of March, 1914, of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	69,000	15,573	£28,322
Robinson Deep ...	110	8	45,360	15,308	27,106
Knights Deep ...	400	11	79,000	14,527	7,304
Simmer Deep ...	180	9	53,700	9,729	3,001
Sub Nigel	25	1	4,835	2,370	2,665
Totals	1035	36	251,895	57,507	£68,398

Total gold in reserve:—Simmer and Jack, 2,750 ozs.; Robinson Deep, 2,357 ozs.; Knights Deep, nil; Simmer Deep, 1,227 ozs.; Sub Nigel, 900 ozs.; total, 7,234 ozs.

The sundry revenue included in the above total declared profits is as under:—Simmer and Jack, £2,500; Robinson Deep, £323; Knights Deep, £260; Simmer Deep, £391; Sub Nigel, £194; total, £3,668.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ..	41,100	£52,389	£20,050
Wolhuter	34,100	42,177	14,021
Consolidated Main Reef...	20,700	31,098	9,615
Main Reef West	19,720	24,169	3,046
Knight Central	21,100	24,463	4,006
Total for Group ..		£174,296	£50,738

The Albu Group.

The following are the details of results regarding the March operations of the producing mines of the General Mining and Finance Corporation Group:—

Company.	Stamps.	Tons Crushed	Total Cost.
Aurora West	80	14,476	£14,458
Meyer and Charlton	75	14,980	12,100
New Goch	120	30,000	23,062
Roodepoort United	60	26,577	21,282
Van Ryn	140	38,940	30,238
West Rand Consolidated ...	100	24,000	25,129
	575	148,973	£126,269

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	19 11·7	£18,488	£4,030
Meyer and Charlton	16 1·8	34,364	22,264
New Goch	15 4·5	33,078	10,016
Roodepoort United	16 0·2	21,383	101
Van Ryn	15 6·4	51,139	20,901
West Rand Consolidated ...	20 11·3	30,579	5,450
		£189,031	£62,762

Brakpan Mines.

The following information is supplied in respect to the March, 1914, output:—Stamps working, 140; running time, 24 days; ore crushed, 48,076 tons; tube mills working, 8; ore hoisted, 54,679 tons; ore from dump, 500 tons; waste sorted, 13·42 per cent.; fine gold declared, 16,136 ozs.; value declared, £67,972, equal to 28s. 3d. per ton milled; working costs, £48,045, equal to 20s. per ton milled; working profit, £19,927, equal to 8s. 3d. per ton milled.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of March, 1914:—Tons crushed, 3,813; put for the month of March, 1914:—Central Mines: Tons crushed, 12,650, yielding 8,215·730 fine ozs. Elandsdrift Mine: Tons crushed, 710, yielding 862·065 fine ozs. Vaalhoek Mine: Tons crushed, 1,460, yielding 612·776 fine ozs.; Estimated value of output, £40,706; estimated profit for the month, £24,290.

City and Suburban.

The following are the details of this company's operations for March: Tons milled, 28,267; gold recovered, 11,736 fine ozs.; profit, £20,602.

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THE WEEK IN THE SHAREMARKET.

Firmer with Good Undertone—A Labour Supply, Improving Both in Numbers and Efficiency, the Reassuring Factor.

The market closed on Thursday for the holidays in quite a cheerful mood, and a similar feeling seems to have obtained in London. There the feature was a spurt in Rand Mines and Central Minings, owing, doubtless, to the better news from this side in regard to increase in the native labour force, accompanied by a marked improvement in native efficiency. Indeed, the savings likely to be effected by the displacement of hammer boys by machine drills are likely to cause a big appreciation in Rand stocks. This may read like ancient history, but the fact remains that it is only to-day that the value of the economical reorganisation of the native labour force combined with the utilization of rock drills to their full extent is being properly realized. With the Ulster trouble disposed of, a steady improvement in Rand dividend-payers may be looked for until prices more nearly approximate to investment values. It certainly cannot be denied that there are many good dividend-payers to-day standing at bargain levels. Apart from gold stocks there was little doing during the week. Diamonds and tin shares remain quiet, though greater activity in both departments must attend a more active general market. There is every reason to hope for such a general improvement when the market resumes on Tuesday.

* * * *

	Fri., 3rd.	Sat., 4th.	Mon., 6th.	Tues., 7th.	Wed., 8th.	Thurs., 9th.
Adair-Ushers	—	0 5*	0 5*	0 5*	—	—
African Farms	13 6*	13 9*	14 0	13 9*	13 9*	13 11
Apex Mines	19 9*	19 6*	19 6*	19 6*	19 6*	19 3*
Bantjes Consolidated	14 0*	14 3*	—	14 0*	14 3*	14 0*
Benoni Consolidated	1 10*	1 11	2 0†	—	1 10*	—
Breyten Collieries	29 0*	—	—	—	—	—
British South Africa	18 0*	18 3*	18 3*	18 3*	18 6*	18 0*
Bushveld Tins	0 6*	0 7*	0 7*	0 6*	0 7*	0 7*
Cassel Coals	15 0*	—	15 0*	15 0*	15 0*	15 0*
Cinderella Cons.	6 0	6 6†	5 9	6 0†	5 9	—
City and Suburbans	48 0*	48 0	48 0	48 0*	48 0	47 9*
City Deeps	62 0*	62 0*	62 6*	63 0	65 0†	65 0
Cloverfield Mines	4 0*	4 9*	4 6*	4 6*	4 6*	4 4*
Clydesdale Collieries	9 0*	9 0*	9 0*	9 0*	9 0*	—
Cons. Investments	—	21 0†	—	21 0†	19 0*	19 0*
Cons. Langlaagtes	31 0*	31 0*	30 6*	—	30 9*	32 3*
Cons. Main Reefs	17 9	17 8*	17 6*	17 6*	18 0	17 9*
Cons. Mines Selection	9 6†	—	9 6†	—	—	—
Coronation Collieries	—	21 0†	21 0†	21 0†	21 0†	18 0*
Coronation Freeholds	0 4*	—	0 4*	0 4*	0 4*	0 4*
Coronation Syndicates	3 6*	—	3 6*	—	—	4 0*
Crown Diamonds	8 0*	8 0*	8 0*	7 9*	8 0†	—
Crown Mines Debentures	£98*	£98*	£98*	£98*	£98*	—
Durban Roodepoort	15 0*	—	17 6*	—	—	—
East Rand Centrals	2 2*	2 0*	2 2	2 0*	2 2	2 0*
East Rand Coals	1 8*	1 8*	1 8*	1 8*	1 8*	1 7*
East Rand Deeps	1 6*	1 6*	1 7*	1 6*	1 8*	1 7*
East Rand Props.	37 0*	36 6*	35 0*	36 0*	35 6*	—
East Rand Debentures	£86†	—	£83*	£83*	—	—
Eastern Gold Mines	1 2*	1 2*	—	1 2*	1 2*	—
Ferreira Deeps	48 0*	48 0*	45 0*	50 0†	—	50 0†
Frank Smith Diamonds	5 6*	5 7*	5 6	5 4*	5 3*	5 0*
Geduld Props.	24 6*	24 0*	23 6*	24 6*	24 0*	24 0*
Geldenhuis Deeps	25 0†	—	25 0†	25 0†	25 0†	—
General Minings	—	—	—	—	—	10 0*
Ginsbergs	—	—	—	17 0*	17 0*	17 0*
Glencoe (Natal) Collieries	6 6*	6 6*	—	6 6*	6 9	6 6*
Glynn's Lydenburgs	11 0†	—	—	—	11 6†	—
Government Areas	19 0	20 0	20 0	20 3	20 6	20 3*
Jupiters	—	—	4 3*	—	4 9*	4 9*
Kaalfontein Diamonds	0 3†	—	—	—	—	—
Klerksdorp Props.	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Knight Centrals	9 11	9 11*	9 10*	9 9*	9 8	9 6*
Knights Deeps	—	32 6*	32 6*	—	33 0*	—
Lace Props.	3 2*	3 4*	3 6	3 3*	3 4*	3 4
Luipaardvlei Estates	9 6*	—	9 9*	9 9*	9 9*	10 0*
Lydenburg Farms	2 8*	2 6*	2 6*	—	2 7*	1 7*
Main Reef Wests	7 3*	7 0*	7 0*	7 0*	7 0*	7 3†
Middlevlei Estates	1 1*	—	1 1*	1 1*	1 1*	1 0*
Modderfontein B.	82 3	—	82 6†	—	—	—
Modderfontein Deeps	45 9	45 6*	45 6	45 0*	45 3*	45 6
Natal Navigation Colls.	14 6*	—	—	15 0*	15 0*	15 0*
New Boksburgs	0 10*	0 10*	—	1 0*	1 0	0 9*
New Eland Diamonds	26 0*	—	—	26 0*	—	29 0†
New Era Cons.	5 6*	5 9*	5 9*	5 6*	—	5 6*
New Geduld Deeps	1 11*	1 11*	1 11*	1 11*	1 11*	—
New Gochs	—	—	—	12 6*	12 6*	12 6*
New Heriots	57 6*	58 6	58 0*	—	—	58 0*
New Kleinfonteins	24 0*	24 0*	23 9*	23 6*	23 3*	23 0*
New Modderfonteins	245 0*	245 0*	245 0*	245 0*	247 6*	248 9*
New Unifieds	16 0†	—	—	—	17 0†	—
Orange Diamonds	1 4*	—	1 3*	1 6†	1 2*	1 6†
Piggs Peak	10 0*	—	10 0*	10 0*	10 0*	10 0*
Premier Deferreds	172 6*	—	—	—	—	—
Premier Preferreds	—	175 0*	—	—	—	—
Pretoria Cements	46 0†	46 0†	46 0†	45 0†	45 0†	—
Princess Estates	4 9*	4 6*	4 9*	—	—	4 6*
Rand Klips	2 5	2 7	2 6*	2 6*	2 7	2 7
Rand Nucleus	1 8*	1 8*	1 8*	1 8*	1 8*	1 8
Randfontein Deeps	3 3*	3 3*	3 3*	3 3*	3 4	3 4*
Randfontein Estates	22 9*	22 6*	22 6*	22 3*	22 6*	22 6*
Roberts Victors	17 6*	—	—	—	—	—
Robinson Deeps	29 0*	28 9*	—	—	28 0*	28 0*
Rooiberg Minerals	26 0	26 0*	25 0*	25 0*	25 0*	25 0*
Ryan Nigels	2 6*	2 6*	3 0†	3 0†	3 0†	3 0†
Shebas	4 6*	4 6*	4 6*	4 6*	4 6*	—
Simmer Deeps	—	2 0	1 9*	2 3*	2 3*	2 3*
S.A. Breweries	41 0†	41 0†	41 0†	—	40 0*	—
S.A. Lands	3 0*	3 3†	3 0*	3 0*	3 0*	3 0*
Springs Mines	14 0*	14 0*	14 0*	14 3*	14 9	14 3*
Sub Nigels	11 6*	11 9*	11 6*	11 6*	13 0†	11 0*
Transvaal Coal Trust	29 6	29 0*	29 0*	29 0*	29 0*	29 0*
Transvaal Cons. Lands	20 0*	20 0*	20 0*	—	—	—
Transvaal G.M. Estates	39 0*	39 0*	39 0*	39 3*	39 6	39 0*
Tudors	—	—	—	1 0*	—	—
Van Ryn Deeps	44 3*	44 3	44 3	44 0*	44 6	44 6
Village Deeps	36 6	37 0*	37 0	—	—	37 0*
Vogel Cons. Deeps	0 9*	1 0*	—	—	0 9*	1 0*
West Rand Cons.	7 6*	—	7 6*	7 6*	—	8 0*
Witbank Collieries	43 0*	43 6*	43 6*	43 6*	43 6*	43 6*
Witwatersrands	69 0	—	69 9	—	69 3*	69 0*
Witwatersrand Deeps	53 0	53 0	52 0*	52 0*	52 9*	53 6*
Wolhuters	15 6*	15 6*	15 6*	15 6	15 3*	15 3*
Zaaiplaats Tins	29 0*	29 0	28 0	27 6	27 0	26 9

*Buyers †Sellers

*Buyers. †Sellers.

MINING MEN AND MATTERS.

Mr. D. C. Greig has been elected Chairman of the Stock Exchange, and Colonel Bettington Deputy Chairman.

* * *

Mr. R. G. Pearson, A.I.M.M., is re-visiting the Rand after a lengthy absence on professional duties in Rhodesia, the Straits Settlements and Nigeria.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

May 6.—Van Dyk Proprietary; Lancaster West; Tudor; Modder Deep Levels; Geduld Proprietary; Princess Estate; May Consolidated (annual).
May 15.—Bucks Reef (Special).
May 20.—Apex Mines, New Kleinfontein (Annual)
May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).
May 27.—Consolidated Langlaagte Mines; Ginsberg; Glencairn; Government Areas; New Primrose; New Rietfontein; New Unified; Van Ryn Deep; Witwatersrand G.M. (annual).
June 23.—Transvaal Consolidated Lands (annual).
June 17.—S.A. Gold Mines; Leeuwpoort Tins; African Farms.

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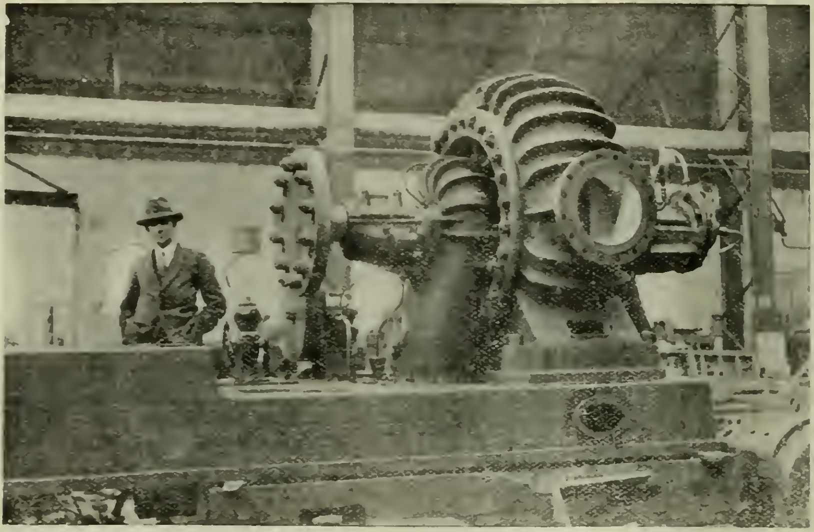

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Engineering Notes and News.

Compressed Air Leaks.

It is reported that an Illinois manufacturer periodically introduces essence of peppermint into his compressed air tank for the purpose of tracing leaks in his air system. If the air is escaping, it may be detected by the odour.

Johannesburg Electric Supply.

According to the annual report of the Johannesburg Electric Supply Department the total output for the twelve months amounted to 22,362,803 units, as compared with 19,885,541 units for the preceding year, showing an increase of 2,447,262 units, equal to 12·4 per cent. on the output for last year. It is anticipated that this rate of progress will continue during the coming year, as several large industrial firms are about to be connected to the Council's mains. The total number of consumers receiving supply from the Council's mains at the end of June, 1913, was 12,300, while for the previous year the number was 10,217—thus the number has increased by 2,083, or at the rate of 20·1 per cent. This represents an average of 173 new connections per month, as against an average of 167 during the previous year, and the demand shows no signs of diminishing at the present time. The maximum load for the year was 9,500 kilowatts, as compared with 8,600 kilowatts during the year 1911-12—an increase of 900 kilowatts. During December the cost per unit was as low as ·508d., as compared with ·549d. per unit, the lowest figure reached in 1911-12. The progress made during the year by the Department is shown below, the figures for the previous year being in parenthesis:—Total output in units, 22,362,803 (19,885,541); total revenue, £232,664 (£269,833); total number of connections, 12,300 (10,217); number of street lamps—incandescents, 5,335 (3,745); arcs, nil (151); maximum load on plant in kilowatts, 9,500 (8,600). The Council's generating plant, at the end of June, 1913, consisted of the following:—Direct-current generators: No. 1 Belliss & Morcom non-condensing, of 500 kilowatts; No. 2 Belliss & Morcom non-condensing, of 500 kilowatts; No. 3 Belliss & Morcom condensing, of 1,000 kilowatts; No. 4 Belliss & Morcom condensing, of 1,000 kilowatts; two "Allen" direct-current sets, 500 kilowatts; two "Mather & Platt" motor generators, 500 kilowatts; two "Turner" sets, non-condensing (stand-by), 400 kilowatts. Motor converters: No. 1 Bruce-Peebles motor converter, of 1,250 kilowatts; No. 2 Bruce-Peebles motor converter, of 1,250 kilowatts; No. 3 Bruce-Peebles motor converter, of 750 kilowatts; No. 4 Bruce-Peebles motor converter, of 750 kilowatts. Alternating-current generators: No. 1 Belliss & Morcom condensing turbine, of 3,000 kilowatts; No. 2 Belliss & Morcom condensing turbine, of 3,000 kilowatts; No. 6 Belliss & Morcom reciprocating set, of 1,000 kilowatts; total capacity of central station plant, 11,400 kilowatts. Since the 30th June, 1913, the new 3,000 k.w. turbo-alternator has been put to work, and, for the first time in the history of the department, there is now a certain margin of stand-by plant.

New Patents.

59. William Noel Bickford Smith.—Improvements in electric fuses for blasting purposes.
60. James Ferdinand Groom Roberts.—Improvements in portable or field cooking apparatus.
61. Andre Leon Felicien Levy-Strauss.—Improvements in rotary engines or motors.
62. Thomas Patullo Jones.—Improvements in means for protecting the head, arms and other portions of the body from mosquitos and other insects.
63. Albert Carmel.—An improved specific remedy for the cure of influenza colds, kidney and stomach diseases and the like.
64. Seymour Edgar Hubbard and Alfred Edward Barker.—Improvements in stope and like conveyors.
65. Robert Francis Venner.—Improvements in electric heating and cooking apparatus.
66. John Frederich Isbell.—Concentrator.
67. Frank Ondra.—Apparatus for concentrating and classifying pulverised substances.
68. Dr. Gotthold Issler.—Process of and apparatus for the manufacture of explosive charges of fusible explosives.
69. Daniel Shaw Waugh.—Improvements in drilling machines.
70. Lancelot Ussher and Armour Hall.—Improvements in fastening devices.

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ACCIDENT PREVENTION AT AN AMERICAN MINE.

Details of Measures Taken at a Typical American Property to Increase Safety.

[By LINDSAY DUNCAN.]*

Accident prevention in a large industrial plant is a business by itself and requires for its successful prosecution as much care, forethought and energy as would be required by any other department. The Nevada Consolidated has attacked the problem vigorously and spared neither time nor money in its effort to effect a material reduction in the tale of death and suffering which has been the inevitable accompaniment of modern industry. The first step was to obtain accurate data of the accidents, and this was done by requiring each foreman to file a report of every accident, however trivial, answering the three questions: (1) What happened? (2) How did it happen? (3) Could it have been prevented? These reports were studied and an earnest effort was made to prevent the recurrence of the same type of accident. One difficulty which arose was that of meeting new conditions. The metallurgy of copper has advanced rapidly during the last few years, and practice at McGill has kept well abreast of modern methods, with the result that processes have changed greatly during the past six years and new types of accidents have arisen, requiring new safety devices. Thus the huge new basic converters, each of which can blow to blister copper 200 tons of matte in a day, have developed possibilities for accidents which did not exist in the smaller acid converters, and have necessitated a whole new line of safety appliances.

UNDERGROUND RISKS.

In taking up briefly the various methods of safeguarding our employees, I will describe a few of the characteristics of the work in each department. In the Veteran mine a top-slicing system is used whereby the ore is taken from the top of the deposit, dumped down raises into ore-bins on the main haulage level at the bottom of the ore body, then trammed to the foot of the shaft, where it is elevated in five-ton skips to the surface. Signs, marked " Fire Escape," with an arrow pointing the direction of travel, are placed underneath an electric light at all cross entries. At the mouth of the drift leading to the fire escape itself, a large red light is placed. The fire exit is downcast, while the main shaft is upcast. In the fire exit are rest platforms every 18 feet, on which four or five men can stand at one time. Fire drill is held every two weeks, when all the new miners are required to use the fire exit in leaving the mine. Three complete Draeger rescue outfits are kept at the head-frame and a selected body of men are trained in their use. A man equipped with one of these helmets can travel and work in a poisonous atmosphere for a long period of time. Their use and availability in the case of a mine fire would doubtless mean the saving of lives which would otherwise be lost. The cage in the main Veteran shaft is, of course, equipped with safety-dogs; but in order to be sure that the safety devices are operative, once a week the safety devices are tried, to prove conclusively that everything is in working order.

RISKS IN OPEN-PIT WORK.

Most of the Nevada Consolidated ore is mined by steam shovels at Copper Flat. The risks incidental to mining of this nature fall readily into four classes: (1) those due to the operation of steam shovels and churn drills; (2) those due to blasting and handling of exposives; (3) those due to transportation of ore and over-burden; and (4) shop accidents. Most of the accidents on the shovels and drills have been due to men getting caught in the machinery. To prevent this, all gears, on both the shovels and drills, have been housed. On the shovels, the crowding and swinging engines are completely enclosed, and also the moving parts of the main engine. The crane-man's seat has been changed from underneath the boom to the bull-wheel, so that now there is no chance for a chain to strike him should it break; and the steam pipe to the crowding engine is run inside the boom and strongly bracketed to prevent its being jarred loose and scalding him. Both drills and steam shovels are well provided with steps and grab irons, which are always kept in good repair and are at once replaced when damaged. The shovels and drills are worked two shifts, and between shifts there is a fireman on duty at each machine. This effectively prevents malicious or irresponsible persons from deranging or starting the mechanism. In case of serious accident the locomotive crane, which is under steam 24 hours of the day, can start at once for a wreck and quickly lift cars, timber, rocks or whatever might be upon an injured man. Powder handling and blasts have been a prolific source of injury. The company has appreciated this, and in the booklet of rules, issued to each employee of its mining department, 16 out of the 68 paragraphs are devoted to shops, shovels and drills; 18 to train service, and 34 to blasting, the use of explosives and warning signals for blasts. In general these regulations lay down the approved methods of blasting and handling of explosives and counsel safety in every line. Each shovel and each drill is equipped with a high-grade whistle, one of a different tone being placed on each machine. These whistles are inspected and kept up the samo as a piece of machinery. Loading, firing and handling explosives is done by certain particular employees, who are known as " powder men," and wear distinguishing badges. No others are permitted to officiate, and any unauthorised person handling powder would be at once discharged from the company's service. Safety precautions for the train service at the mines, and also at the smelter, are patterned very closely after standard switching practice. Equipment is carefully inspected and promptly repaired; all accidents to equipment, however trivial, are reported and investigated; approved danger signals and semaphores are installed, and as far as possible only experienced men are employed.

SURFACE WORK.

Shop accidents are guarded against (1) by making the machinery as nearly fool-proof as possible and then preaching *Caution—First, Last, and Always.* By way of illustration, all emery wheels are cased, circular saws have protectors, all gears are housed, safety set-screws are used throughout, goggles are provided for workmen whose eyes are exposed, motors and switches are fenced in, etc. Unloading the ore on the concentrator trestle has always been a prolific source of accidents. Ore is received in 55-ton hopper-bottomed steel cars, running in trains of 21 or 22 cars each, as many as ten trains a day arriving from the mines. The ore as loaded by steam shovels is frequently in lumps several feet in diameter, and in the winter season an entire car is sometimes frozen into a solid mass. The ore in fully two-thirds of the cars has to be blasted, and this is done by a special crew carefully instructed in its duties and acting under a definite set of rules for the handling of explosives. The tops of the bins are protected by heavy iron gratings which effectively prevent any ono from falling in while the ore is being discharged. Before the gratings were installed several workmen were injured, both by falling into the bins and going to sleep and then forgetting to wake up before the ore was dumped. The stairs, working platforms and walk-ways of the mill are thoroughly protected by hand-rails. Projecting set-screws on shafting have been removed, and no loose flooring or open hatchways are permitted. In a plant of the size of the Steptoe plant, these simple precautions entailed a vast amount of labour and expense. The shops of the company are very complete, and include a pattern shop, foundry, tin shop, garage, paint shop, machine shop, blacksmith shop, structural shop, pipe shop, and planing mill. In these shops about 150 men are employed, a fairly large industry in itself. Every emery wheel has a heavy steel plate protector

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*Read before the Industrial Safety Conference, University of Nevada, January 27.

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fitted around it, and the saws and planes in the wood shop are similarly protected. Most of the machines are motor driven, and where belts are unavoidable they are boxed in wherever it would be possible for a workman to come in contact with one. Drip pans are provided to catch the oil from machines, so that there can be no slippery places to invite falls. Metal cans with self-closing lids are conveniently placed to receive oily waste. Several chemical fire extinguishers of approved type are in each building. and on several occasions incipient fires have been extinguished by promptly using them. The power plant is rated at 10,000 h.p. and is actually generating an average of 7,000 h.p., which is an unusually large output for a plant of this rating. In fact 25 to 30 per cent. is the usual ratio of output to capacity, and the 70 per cent. output at McGill is an indication that the power plant is worked well up to capacity. The plant consists of nine direct connected engines and eighteen water-tube boilers; ten of the boilers are in the flues of the reverberatory smelting furnaces and utilise the waste heat of the gases. The power house is the original home of the hand-rail in McGill, and it is encountered on all sides. The switchboard is surrounded by a railing within which no one is permitted except the operator. The metal steps leading to the main engine bearings are not only supplied with hand-rails, but the treads are also of rubber studded with lead. This is the same material which has been adopted by the Pullman Car Company as a standard for the car steps. The stair and hand-rail habit has percolated thoroughly through the entire power plant; fly-wheels, generators, vacuum-pumps, condensers, economisers, feed-water heaters and boilers are all so equipped. The steam lines are all strongly anchored and well supported and a leaky steam joint is not tolerated. Superheated steam at high pressure is hard to handle and as a result no liberties are taken with it.

DANGER SIGNALS.

In case of men working on an electric line, the switch is opened and a sign, "Danger: Men are working on this line," is hung on the open switch. The switch cannot be closed until the man who has been working on the line, and no one else, removes the sign. The automatic stokers have been a fruitful source of injury to the fire-room labour. Only recently one of the ash-wheelers, in an idle moment, availed himself of the temporary absence of the fireman and essayed to start one of the stokers "to see what would happen." He not only saw what happened, but felt one of his fingers depart. In the smelter, sheet iron protectors have been placed along all elevated hot metal and calcine tracks, to prevent men passing underneath from being burned. All charge hoppers are protected by gratings; hand rails are liberally used and walk-ways and stairs are of substantial and permanent construction. Signs and warnings in English, Greek and Slavish are liberally used, and respirators and goggles are distributed to the workmen whose occupations make them necessary. In the industrial car system, which is used to carry concentrate from the mill to the roaster, calcines from the roaster to the reverberatory furnaces, matte from the furnaces to the converters, and slag and secondaries from the converters back to the reverberatories, many safety devices have been placed, both on the cars and the locomotives. These include chains to prevent slag pots from dumping during transmission, grab-irons and steps, steel running boards, and wooden treads to prevent slipping. An earnest endeavour is made to keep the track up to modern standard. Manganese steel frogs are used on account of better wearing qualities, cast iron frog fillers are used to prevent a switchman catching his foot and being thrown in front of the train. Safety niches have been placed in trestles and places where the trains run with narrow clearance to lessen the danger of a switchman being caught. The Nevada Consolidated has organised a regular Safety Department under W. H. Droll as safety engineer, and to him I am indebted for much of the information contained in this paper. The Safety Department suggests changes and protective devices, and in general makes it its business to investigate and report on all accidents which occur, or which might occur, around the plant.

Finance, Commerce, and Industries.

The South African Whaling Industry.

Some interesting facts regarding the whaling industry were given before the Dominions Commission by Mr. J. J. Egeland (managing director of the Union Whaling Company), and Mr. A. F. Pearpark, who is the manager of another company. They handed in the following statements:—

Durban is the cradle of the whaling industry in South Africa (according to Norwegian methods). To-day we have six whaling stations in Natal, five at the Bluff and one at Park Rynie. Capital expenditure over quarter of a million sterling. Only two of these companies have paid any dividends. Altogether about 25 whaling steamers are employed in Natal. Average cost about £5,000. Six were built in England, the rest in Norway. Most of the blubber and press boilers were constructed in Natal. Harpoons and whalelines are imported from Norway, also most of the powder. Being for industrial purposes the Customs duty (15 per cent.—gunpowder 6d. per lb.) seems unreasonably high. The South African Railways charge £4 per whale for carting the carcases to the Bluff station, also unreasonably high. Moreover, each company pays annually to the Provincial Government £50 and £5 for each whaler. Further, the Union derives revenue from leases of land, craft licences and dock fees, trading licences, etc. (company licence £1 per £1,000 capital). No other industry contributes so much to the revenue of this country in proportion to its extent. The Durban Corporation also derive large amounts annually from the whaling stations for supply of water. The cost of shipping oil to Europe (including packing) is about £5 per ton. The high cost of living in Natal also mitigates against the success of the local industry. Last year the shipping companies raised the freight of oil to £1 4s. 9d. per ton. In their own interest they ought to go back to the previous rate of 20s. per ton freight. Harpoons and whalelines, also gunpowder, should, in my opinion, be free of duty, and the railage on whale carcases reduced to £2 per whale. The baleen whales (or whalebone whales) begin to arrive in the month of May, migrating northwards. In August-September they begin to return southward. After the end of November and until April-May hardly one baleen whale has been seen off the Natal coast. Very rarely are many baleen whales seen off the Natal coast in any one day. It is, therefore, deplorable that more than one, or at most two, stations should have been allowed in any one port. At Durban, for instance, there is not room for more than two companies. I estimate the local value of last year's products at about £140,000. Over 5,000 whales have been landed at Durban altogether. In my opinion it is now too late for the Union Government to do anything for the protection of the industry (except by reducing railage, duty and licences). It is impossible to exterminate the whales. There are probably more whales in the sea to-day than ever before. The thing will regulate itself. When in a whaling field the number of whales decrease so that the industry is no longer payable, whaling there will necessarily cease in that particular field. There are and always will be millions of whales in the seas. But to preserve the industry, governments might jointly or separately insist that: (1) No whale under a certain size shall be killed, say, 25 ft. for baleen whales. (2) That the whole whale carcase shall be used up, not only the

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blubber, but also the flesh and bones. Most of the whale oil and nearly all the sperm oil has been exported to Europe. The bulk has gone to Glasgow, some to the Continent, and a little to Australia. The local demand for whale oil is increasing. About the half of last year's Natal production was disposed of for home consumption. Most of the fertilisers have been consumed in South Afrida. Some have been exported to Mauritius. Whalebone, whale finners, and sperm tusks find no market in this country. France has taken the bulk of the whalebone and finners.

* * * *

Dominions Commission and Natal Industries.

Before the Dominions Commission last week evidence was given by representatives of the Manufacturers' Association, who pointed out the suitability of Durban as an industrial centre. Evidence was also given on behalf of tea and sugar industries. Regarding the former, it was stated that since the stoppage of the importation of Indians the importance of the industry was decreasing, and tea estates were now turning attention to sugar and wattles. Regarding sugar, it was stated that despite the increase in production, it did not yet fully supply the South African market, which increased as rapidly as the production. Though wages had risen greatly since the stoppage of Indian immigration, if the present prices of sugar continued, the industry would remain profitable.

* * * *

Transvaal Agricultural Progress.

The thirteenth annual conference of the Transvaal Agricultural Union was opened last week at Pretoria by the Administrator. Mr. E. W. Hunt, president, in his address, referred the severe drought, stating that stock had suffered most seriously, and great losses had been sustained. Crops had also suffered, and the output of maize, which is one of the most important of our products, is likely to be less than one-third of what was anticipated. Tobacco, which in some of our districts is our most valuable crop, has almost entirely failed throughout the country, and most severe losses have been sustained by some of our most progressive farmers. He called attention to the possibilities of the bacon industry, pigs being fed on what are now regarded as waste products from dairies. He sympathised with the farmers of the Orange Free State in the great stock losses they had sustained through drought, and spoke of water conservation and the necessity for winter feeds. The Administrator said there was a need for schools in the country districts which would approximate to trades schools in the towns. He expressed the opinion that the Transvaal would do well to rely on small irrigation schemes rather than on large and expensive ones.

* * * *

Johannesburg Building Operations.

The year has not been marked by any increase, but the building trade has been well maintained, says the Johannesburg Municipal annual report. Last year's returns included very large amounts for the new Town Hall, New Market and other public buildings. One of the marked features of the local building trade this year has been the number of industrial and warehouse buildings, mainly in Newtown and Market Street East. There is every indication that the distribution trade, to parts both near and far, has been progressing by leaps and bounds, and it appears that this must be held to account for the steady maintenance of building operations, and the great growth that has been going on for the past four years—unbroken and without much fluctuation. The following are the records of the past few years:—

	Value Approved.	No. of Plans.	No. of Buildings.
1907-8	£315,391	1,969	3,003
1908-9	435,457	2,806	4,683
1909-10	1,108,731	2,948	6,289
1910-11	1,438,895	3,297	7,422
1911-12	2,069,810	3,624	7,590
1912-13	1,292,207	3,405	6,698

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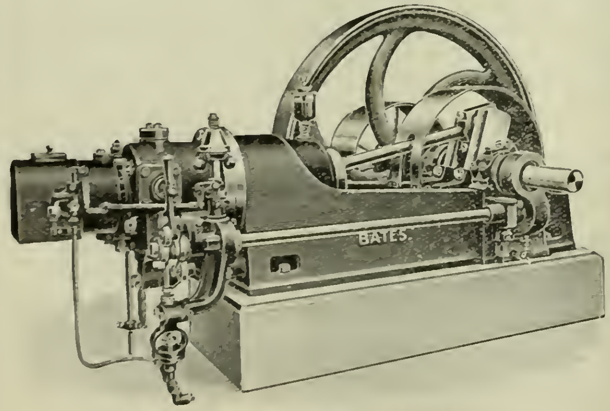

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GRADE, COSTS, AND PROFITS IN FEBRUARY.

Chamber of Mines' Analysis.

The following tabulation of the operations of the mines of the Transvaal contributing to the gold production is supplementary to the details published by the Chamber of Mines in its declaration on the 10th of the month:

THE WITWATERSRAND.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United ...	15,050	24	7	21	5	13,099	1,925	3	2
2. Bantjes Consolidated ...	24,556	24	7	23	4	23,320	948	0	11
3. Brakpan Mines	60,560	26	7	19	2	43.111	16,920	7	6
4. City Deep	66,418	38	7	25	1	42,623	22,221	13	1
5. City and Suburban	45,854	37	4	20	3	24,861	20,477	16	8
6. Cons Langlaagte	50,361	26	0	16	1	30,437	19,057	10	1
7. Cons Moin Reef	27,716	31	9	22	6	19,949	7,696	8	10
8. Crown Mines	224,301	27	8	15	6	125,558	96.175	11	10
9. Durban Roodepoort ...	14,476	21	9	16	2	10,716	3,759	5	8
10. Durban Rood. Deep......	26,846	26	2	23	10	24,423	2,085	2	0
11. East Rand Proprietary	191,458	29	1	21	11	136,794	43,072	6	11
12. Ferreira Deep	97,689	38	11	18	2	45,516	50,965	20	4
13. Geduld Proprietary ...	28,184	32	0	23	11	21,018	7,096	8	1
14. Geldenhuis Deep	61,074	28	11	24	7	51,419	8,373	4	0
15. Ginsberg	17.067	24	5	13	7	12.810	4,007	5	10
16. Glencairn Main Reef ...	13,780	13	8	12	1	11,467	1,475	1	7
17. Knight Central	25,928	24	6	19	7	20,685	4,960	4	8
18. Knights Deep..............	62,582	15	3	12	0	49,664	12,277	3	0
19. Langlaagte Estate	53,500	20	10	18	7	41,033	13,010	5	11
20. Luipaardsvlei Estate ...	18,180	22	4	18	4	14,910	3,062	3	9
21. Main Reef West	23.231	30	1	23	11	18,443	4,490	5	10
22. May Consolidated	7,174	15	10	16	9	7,579	*420	*0	11
23. Meyer and Charlton ...	32,848	48	4	18	0	12,220	20,548	30	3
24. Modderfontein B..........	60.352	36	6	15	6	25,728	33,893	20	6
25. New Goch	29,709	21	10	16	6	22,250	7,381	5	6
26. New Heriot	22,296	35	10	20	7	12,772	9,415	15	2
27. New Kleinfontein.........	63,058	26	8	17	6	41,413	20,941	8	10
28. New Modderfontein ...	81,951	39	6	16	5	34,149	46,983	22	8
29. New Primrose	27,432	24	8	13	0	14,143	12,596	11	7
30. New Rietfontein	12,306	20	3	20	7	12,494	*189	*0	4
31. New Unified	13,822	23	1	15	6	9,002	4,620	8	0
32. Nourse Mines	53,301	27	11	23	11	43,493	8,926	4	9
33. Princess Estate	27,937	26	4	24	9	25.265	1,604	1	6
34. Randfontein Central ...	214,323	24	7	18	1	156,611	55,017	6	4
35. Robinson	75,911	33	6	15	8	35,096	39,080	17	6
36. Robinson Deep	59,918	29	5	17	4	35,270	24,005	11	10
37. Roodepoort United	20,398	17	0	17	5	20,437	18	—	
38. Rose Deep	78,056	24	10	16	5	50,876	26,109	8	5
39. Simmer and Jock.........	61,877	21	3	13	0	37,625	26,230	9	1
40. Simmer Deep	40,464	16	5	14	7	35,905	2,576	1	0
41. Spes Bona Tribute†......	4,834	18	3	—		—	—	—	
42. Van Ryn	46,279	26	3	15	8	27,452	18,827	10	9
43. Van Ryn Deep	56,231	32	11	18	4	31,391	24,929	14	7
44. Village Main Reef	55,212	35	6	18	6	28,287	25,391	16	7
45. Village Deep	58,092	26	11	19	0	40,906	16,486	7	8
47. Vogelstruis Estate.........	12,926	22	0	20	1	11,298	1,669	2	11
48. West Rand Central	3,470	36	4	30	11	2,952	518	5	5
49. West Rand Consolidated	26,199	23	7	21	0	23,165	3,127	2	10
50. Witwatersrand	47,562	24	2	14	2	27,198	20,363	10	7
51. Witwatersrond Doep ...	51,631	27	3	17	6	33,191	18,010	9	6
52. Wolhuter	37,151	25	2	17	6	25,726	11,007	7	6
Miscellaneous producers	6,670	—		—		—	—	—	
Witwatersrand totals	2538211	26	10	17	11	1666450	823,654	8	10
				52 cos.		52 cos.	52 cos.	52 cos.	

*Loss. †Private.

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
Heidelberg—									
1. Nigel	18,919	30	7	26	2	15,705	3,000	5	0
2. Sub Nigel	9,167	41	9	31	5	6,893	2,171	9	11
Barberton—									
3. Barrett	654	4	0	—		—	—	—	
4. Sheba	13,376	42	0	28	10	9,008	4,323	13	10
5. Worcester	3,942	16	1	12	10	3,150	771	3	2
Klerksdorp—									
6. Quest	2,927	13	9	10	3	2,193	734	3	5
Lydenburg—									
7. Ceylon Lydenburg.........	943	29	7	24	2	792	324	10	2
8. Glynn's Lydenburg	7,620	44	2	18	6	3,205	4,348	25	2
9. Transvaal G.M. Estates	37,125	56	1	23	9	15,741	21,063	31	10
Miscellaneous producers	27,302	—		—		—	—	—	
Total (outside districts)	121,975	36	5	23	1	56,687	36,734	14	11
				8 cos.		8 cos.	8 cos.	8 cos.	
Grand totals	2660186	27	1	18	1	1723137	860,388	9	0
				61 cos.		62 cos.	62 cos.	62 cos.	

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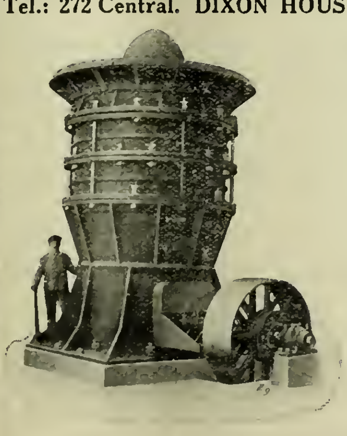

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(Incorporated in the Transvaal.)

Notice to Shareholders.

NOTICE IS HEREBY GIVEN that the Thirteenth Ordinary General Meeting of Shareholders in the above Company will be held in the Board-room, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg, on **Monday, 22nd June, 1914, at 11 o'clock in the forenoon**, for the following purposes:—

1. To receive the reports of the Directors and Auditors, and consider the Balance Sheet at 31st March, 1914, and Statement of Income and Expenditure from 1st April, 1913, to 31st March, 1914.
2. To elect two Directors in the places of Messrs. F. D. P. Chaplin, M.L.A., and C. Davies, who retire by rotation, but are eligible and offer themselves for re-election.
3. To appoint Auditors for the current year and to fix the remuneration for the past year's audit.
4. To transact such other business as may be transacted at an Ordinary General Meeting.

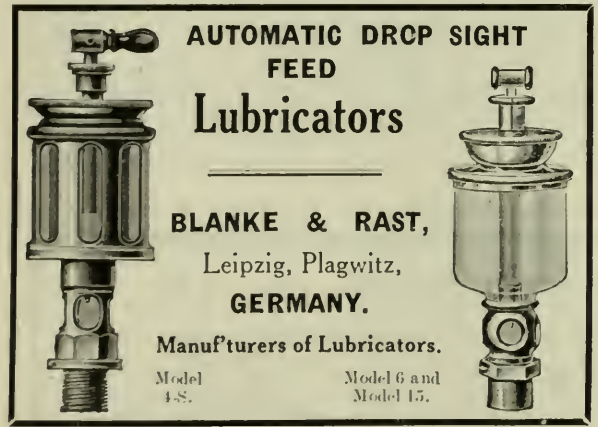
The Transfer Books of the Company will be closed from 15th to 22nd June, 1914, both days inclusive.

Holders of Share Warrants to Bearer intending to vote at this meeting must comply with the regulations concerning the issue of Share Warrants.

By Order of the Board,

The Consolidated Gold Fields of South Africa, Ltd.,
Secretaries.
per J. D. LOW.

Head Office:
Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg.
7th April, 1914



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Standard—Rayne-Paumier Company	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

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MACHINERY PLANT

FOR SALE. FOR SALE.

Tenders are invited by the Victoria Falls and Transvaal Power Company, Ltd., for the purchase of the following plant at Driehoek Power Station:—

(1) **1-1,000 k.w. Vertical Curtis Turbine**, complete, direct coupled to A.C. Generator, 3,300 volt, 175 amp. speed 1,200 R.P.M., 60 periods.

There are two spare generator rotors that would go with this machine.

(2) **1-500 k.w. Vertical Curtis Turbine**, complete, coupled to A.C. Generator, 3,300 volt, 1,800 R.P.M., 60 periods.

The above machines are complete in every respect with all valves, gauges, fittings and pipe connections.

(3) **Two Surface Condensers**, each 2,300 square feet, cooling surface, complete with all valves, fittings and pipe connections, made by Messrs. Hall, Peterborough.

(4) **1-9 Tangye Centrifugal Pump**, arranged for belt drive.

(5) **1-3 Throw Edwards' Type Air Pump** arranged for belt drive, complete with all valves and fittings, made by Messrs. Cole, Marchant and Moorley.

(6) **Two Steam-Driven Duplex Oil Pumps, 3in. x 2in. x 3in.** complete, with all valves, pipe connections, etc.

(7) **Two Pairs Worthington Double Acting Step-bearing Pumps**, for foot step bearings, of Curtis Turbines, 7½in. x 2in. x 6in. These pumps are complete in every respect, with all valves, fittings and pipings.

(8) **One Turbine Step-Bearing Hydraulic Accumulator**, for working in conjunction with the above pumps, and Curtis Turbine.

(9) **Two E.C.C. D.C. Dynamos**, 75 volts, 325 amps., direct coupled to Bumsted and Chandler vertical enclosed high speed compound steam engines, running at 435 R.P.M. These are complete in every respect with all valves, fittings and piping.

(10) **1 E.C.C. D.C. Dynamo**, complete as above, suitable for coupling to high speed engine or motor.

(11) **One Exciter Switchboard**, partly dismantled.

(12) **Three Allis Chalmers cross Compound Corliss Steam Alternators**—Cylinders 24in. x 44in. x 48 stroke—capable of giving a continuous load of 500 k.w. at 75 R.P.M., 3,300 volts, 60 cycles, suitable for working with a steam pressure of 160 to 180lbs. per square inch. The alternators are made by Brown Boverie. The machines are complete in every respect with pipes, valves and fittings.

ALL THE ABOVE PLANT IS ERECTED.

(13) **Two Pairs Worthington, Double Acting, Steam-Driven, Hydraulic, Step-bearing Pumps**, 4½in. x 2¼in. x 4in., complete, but un-erected.

This plant, which may be inspected at the Company's Power Station, Driehoek, by arrangement, will be sold without any guarantee as to condition and steam consumption.

The successful Tenderers will be required to dismantle, load up and cart the material away.

Tenders, which will close on **Saturday, 2nd May, 1914**, must be marked **"Tender for Machinery,"** and addressed to the Company's **Buyer, Box 2671, Johannesburg.**

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1½d. All other parts, 2½d.

CONTENTS.

	PAGE
Notes and News	181
Topics of the Week:	
The Great Rand Show	183
Hygiene in Mines	184
Refractory Ores in the Transvaal	185
Tin and Copper Mining in the Transvaal	186
The Rand's New Mills	187
Annual Review of Rand Mines, Ltd.	187
The Year with the City Deep	188
The Prospects of the Knight Central	189
The Prospects of the Rose Deep	190
The Position of the Geldenhuis Deep	191
Sand-Filling at the Wit. Deep	192
The Outlook for the Nigel	192
The E.R.P.M. Position at a Glance	193
"First Aid" and Ambulance Competitions	193
Oil Shale Mining—III.	194
The Exploitation of Big Low-Grade Deep Levels ...	195
Dominions Commission and Rand Mining Conditions ...	196
Correspondence and Discussion: "Native Labour Recruiting"; "The Plight of the Prospector"; "Mining in the Murchison Range"; "The Prospector's Shortcomings"	197
Rhodesian Section:	
Latest Mining News	199
The Week in the Sharemarket	200
Engineering Notes and News	201
A Review of Recent Engineering Progress	201
Finance, Commerce and Industries	202
Special Agricultural Machinery and Automobile Supplement	203
Agricultural Machinery at the Rand Show—I. ...	203
Irrigation in South Africa	205
Increasing Use of Oil Engines in South Africa ...	205
The Motor Fuel Question in South Africa	207
The Question of Tyres in South Africa	208

Notes and News.

Development at the Wolhuter.

The position at the Wolhuter, where important development work has recently been commenced on the 22nd level east, Main Reef Leader, remains unchanged. A station is being cut and no further work of importance in the direction of probing reef values has been undertaken. We understand, however, that one or two recent assays have confirmed the satisfactory results obtained where the Main Reef Leader was first intersected in this portion of the mine, and as stated in this journal a week or two ago these values, if maintained, in the eastern section of this property, which is virtually unexploited, cannot fail to be of the very foremost importance to the Wolhuter Company. A dividend has just been declared by the company.

* * * *

Index.

The index to Vol. XXIII., Part I., covering period September 6th, 1913, to February 28th, 1914, of the *South African Mining Journal*, will appear in the issue of the 25th inst.

* * * *

E.R.P.M. Outlook.

Sir George Farrar's description of the position of the E.R.P.M. on Thursday was certainly frank and clear. The shortage of native labour is the most serious menace, and apparently the E.R.P.M., owing to its peculiar circumstances, cannot avail itself of small rock drills, as other mines. Sir George frankly warned shareholders to expect a reduced dividend this year, as a consequence. His comparison of the financial position of the company to-day and two years ago certainly redounds to his credit, and speaks eloquently of the sincerity of his personal efforts to rehabilitate the property. Unfortunately the mining position, and not the financial position, has always been the trouble; and it is to be hoped that by the time Sir George returns from his holiday the former may have improved.

* * * *

Wankie Coal in Katanga.

An important agreement has just been concluded between the Wankie Colliery Company and the Union Minière du Haut Katanga, under which the great Belgian mining company will take its fuel requirements for lump coal, washed coal, and coke for use at its smelting works at Elizabethville for ten years from July 1st, 1915, the minimum quantity to be taken annually being 100,000 tons, of which not more than 60,000 tons shall be coal and at least 40,000 tons coke. The contract also includes the supply by this company of fire clay (ground and unground) and ordinary and special fire bricks. To enable the company to increase its plant additional working capital will be required. It is therefore proposed to increase the authorised issue of debentures to £100,000, and to provide that the debentures for the time being outstanding shall be redeemed by annual drawings at the rate of £7,000 each year. The effect will be that redemption of the whole issue will be effected by the end of 1928, and the ultimate date specified in the existing debentures will be postponed accordingly. Of the original £60,000 authorised debentures £40,000 are now outstanding, and it is proposed to issue and to offer to existing debenture-holders the additional £60,000 at par. The new will bear the same rate of interest as the existing debentures.

* * * *

Tweefontein.

The Tweefontein Colliery, Ltd., experienced a very satisfactory year in 1913, the profits permitting of dividends aggregating 25 per cent. The net profit after allowing for debenture interest and depreciation was £14,856, and, with the carry forward of £9,980, the directors had at their disposal £21,398 after the payment of an interim dividend of 1s. 6d. per share in October. It is proposed to pay a final dividend of 3s. 6d., making 25 per cent. for the year, leaving a balance to go forward of £13,375, or £3,400 more than a year ago. The output of coal was on a slightly higher scale than in 1912, and it is encouraging to learn that the Transvaal Coal Owners' Association, through the medium of which the Tweefontein Colliery disposes of its product, expects an increase in trade during the current year unless no unforeseen disturbance arises. From the manager's report we gather that the colliery is in an excellent condition, and is in a position to yield a much larger output than has been called for.

* * * *

Alluvial Diamond Prospecting.

The returns of diamonds found in the Western Transvaal during March amount to 4,127 carats, valued at £18,903, which is an increase of over £3,000 on that of February. The diggers are not increasing in number, but are scattering far and wide. Farmers all over the Western Transvaal who have hitherto refused permission to prospect on their farms are now removing their opposition, says the Klerksdorp paper, and the consequence is that diggers are spreading far and wide in the search for the elusive gems. Diamondiferous gravel exists from Klerksdorp to Fourteen Streams along the Vaal River and including a strip of at least fifty miles wide, and all over this area prospecting operations are going on with varying results. This may lead to the discovery of other rich deposits, and to rushes to places hitherto unsuspected of containing diamonds.

* * * *

West Rand Central.

The report of the West Rand Central Gold Mining Co., Ltd., for the year ended September 30 last states that during the period 23,280 tons have been treated for a yield of 9,358·21 ozs., which has realised gross £40,835, equal to 8·039 dwts. per ton treated, comparing with 28,330 tons, yielding 10,309·798 ozs., realising £44,679 for the previous year, equal to 7·278 dwts. per ton treated. Although the tonnage treated was less than the previous year, the ore was nearly 1 dwt. per ton better in value. The profit for the year, before making allowance for depreciation, amounts to £2,056, as compared with £2,256, the mill having worked 215 days last year as compared with 252 days, the net result being that while in 1912 the profit per ton treated was 2s. 6·574d., in 1913 it was 2s. 10·557d. per ton. The directors regret that the funds at their disposal are not at present sufficient to enable them to make a return to the shareholders.

* * * *

The I. of M.M. Prizes.

The annual meeting of the Institution of Mining and Metallurgy was held in London in mail week. The report of the Council and statement of accounts for 1913 were received and adopted. In addition to Dr. F. H. Hatch, who was installed as president, Mr. Edgar Taylor has been re-elected as treasurer, and Messrs. W. A. Carlyle, W. R. Feldtmann, F. W. Harboard, George T. Holloway, E. T. McCarthy and Hugh F. Marriott have been elected or re-elected as vice-presidents for the year ending in March, 1915. The chief awards for the year were announced as follows: "The Consolidated Gold Fields of South Africa, Limited," gold medal—Messrs. Allan Jay Clark and William J. Sharwood for their paper on "The Metallurgy of the Homestake Ore"; "The Consolidated Gold Fields of South Africa, Limited," premium of forty guineas—Mr. Lewis Henry Cooke for his papers, "Specification of a Precision Theodolite," and "Some Consideration on the Specification of Theodolites for Mines"; the "William Frecheville" Students' prize of ten guineas—Mr. Philip Litherland Teed for his paper on "The Determination of Water in Coal." Post-graduate scholarships of £50 each have been awarded to Messrs. J. W. Lake, G. N. Scott, J. A. Goepel, and Thomas Robertson. The new president (Dr. F. H. Hatch) then delivered his presidential address.

* * * *

Queensland Mining Industry for 1913.

The annual report of the Under Secretary for Mines (Mr. A. R. Macdonald), giving a resumé of the mining industry of Queensland for the year 1913, has been issued. The report shows that the total value of the mineral production of the State for the year was £3,857,881, which is £317,471 less than for the immediately preceding year, the decrease being the result of the continued decline in the gold yield. In making this comparison it must be remembered that the 1912 output was over half a million more than that for 1911, and was, with one exception, the highest in the annals of Queensland mining.

* * * *

Modder Deep Development Results.

On Tuesday the following particulars of work done on the Modder Deep were issued:—During the quarter ended 31st March last, 4,256 feet were driven, risen or sunk, inclusive of 114 feet sunk in the main incline shaft. 3,345 feet were sampled, showing an average assay value of 9·3 dwts. per ton over 48·8 inches. Since the commencement of development work a total of 20,838 feet has been driven, risen or sunk, of which 16,492 feet have been sampled and show an average assay value of 9 dwts. per ton over 45·8 inches. Excavations for the milling plant are well in hand and work is proceeding satisfactorily in all directions.

* * * *

The "Colour Bar" Petition to Parliament.

The following is the text of the petition from A. Jacobs and 1,623 others, residents of the Transvaal, praying for the removal of the "colour bar" from the Transvaal Mines, Works, and Machinery Regulations, presented to the House on the 7th inst.: (1) Under the Mines, Works and Machinery Regulations of the Transvaal, coloured persons are placed under serious disability solely on the ground of colour, and without reference to competence or ability. The Mining Regulations are framed in a manner which prevents your petitioners from earning their living by following their trades as carpenters, engine drivers, and other occupations. In this respect your petitioners humbly refer to the Mines, Works and Machinery Regulations. In particular Section 285: "Certificates shall not be granted to any coloured person in the Transvaal and Orange Free State, and certificates granted to any coloured person in any other Province shall not be available outside such Province"; and further to the definitions given to banksmen, ganger, and onsetter. (2) Your petitioners are denied blasting certificates, even though they may have held such certificates in the Cape Province. (3) Wherefore your petitioners earnestly pray that wherever the definition "white" appears it should be substituted by the word "competent," and that wherever the colour bar has been introduced into the regulations it should be removed.

* * * *

The Position of the City Deep.

A map attached to the annual report of the City Deep enables one to realise more accurately than from any statistics or statements how great the possibilities of this mine are. The City Deep property is over two miles in breadth from east to west along the strike of the Reef, whilst from the northern to the southern boundary is a distance of roughly one mile. The plan in question shows ore developed as well as ore stoped, and the extent of the workings as they stand to-day is quite insignificant in comparison with the area of mining ground owned. Probably the two outstanding features in connection with the mine to-day are (a) the recent satisfactory disclosures that have attended development operations, and (b) the high cost of operation. These features are prominent in the annual report for the year ended with December last, and to which more extended reference is made elsewhere in this issue. The statement as to ore reserves is particularly gratifying, the total tonnage developed at the end of 1913 (2,167,650 tons of an average assay value of practically 10 dwts. per ton) showing in comparison with the estimate for the previous year an increase of 44,000 tons and an improvement in grade of 1·3 dwts. As to expenditure, working costs were 25s. 7d. as against 23s. 9d. in 1912, and it is to be observed that the cost of mining alone, quite apart from development, was 16s. 3d. per ton. These high costs are attributed to shortage of native labour, increased development operations, the disorganisation and unsettled feeling following on the strike of employees in July last, and to the fact that no rock from surface dumps was milled. Despite these disadvantageous circumstances, the profit, thanks to an improvement in grade of 2s. 3d. per ton, was about £4,000 better than in 1912. Whilst profits last year averaged a little under £25,000 per month and ore crushed under 40,000 tons per month, a marked improvement in returns is to be observed in last month's official statement. The ore crushed aggregated 42,000 tons, working costs were reduced to 23s. 7d. per ton, and the total estimated profit was £30,971. These better results are, we take it, the direct result of an improvement in the supply of native labour, which, as both Mr. Madew and Mr. Sherwell state in their reports, will prove itself to be the determining factor of this year's work. It is pleasing to note the improvement in the health conditions of the mine and the strenuous efforts to further better matters in this direction. The City Deep is undoubtedly a great mine, and much better returns than have so far been secured may be confidently expected in the near, if not the immediate, future.

* * * *

"T.C.L." Position.

In our last issue extracts were printed from the consulting engineer's report upon the "T.C.L." Company's prospecting and mining operations. During the year 1913 an amount of £16,448 6s. 5d. has been expended on the following propositions which are being developed either by the company itself or jointly with other parties:—Mutue Fides (remaining portion), No. 1844, district Waterberg (tin), in which the company owns the entire interest. Montrose mine, district Barberton (gold), in which the company owns the entire interest. Zaaiplaats lease, district Waterberg (tin), in which the company's interest is 50 per cent. Marico zinc workings, in which the company's interest is 40 per cent. The company's interest, viz., 20 per cent., in the Butterfly-Cecil Group, Rhodesia (gold), has been disposed of as mentioned in the consulting engineer's report. In addition to the above, a sum of £11,297 6s. 6d. has been written off in respect of the prospecting of the company's own farms, various properties offered to the company, and portions of the Barberton district which were thought to be worthy of investigation. The only discovery reported in connection with the farms thrown open by the company to public prospecting has been in respect of Kwarriehoek, No. 1589, district Waterberg, where a discovery of tin has been reported but not yet investigated by Government. The company's shareholding in this concern remains as previously reported, viz., 33,334 out of a total issued capital of 45,000 shares of £1 each. The loan of £9,364 made to enable this company to complete its development and plant was reduced during the year to £7,000. Towards the close of the year it was found necessary to provide further plant to deal with the ore which had become so refractory that it was impossible to obtain a profitable recovery with the existing plant. To provide the funds necessary for the increase in plant, the company agreed to advance the Rietfontein (T.C.L.), Ltd., a further sum of £4,000. The alteration to the plant was expeditiously carried out, and crushing has at the time of writing this report been re-commenced. The shareholding in Fairview (T.C.L.), Ltd., has been increased from 26,250 to 27,750 shares, due to the sale by the company to the Fairview (T.C.L.), Ltd., of its interest in certain water-right, known as the Kidson water-right, for 1,500 shares in the Fairview (T.C.L.), Ltd. The loan of £5,000 made to this company as reported last year was reduced to £3,500 at the 31st December, 1913, and has since been further reduced to £1,750. Additions to the plant were made during the year, and were completed in July last, up to which date, pending the erection of the new plant, only sufficient tonnage was crushed to cover expenses, so as to avoid unnecessary loss of gold. The plant is now running satisfactorily, and development of profitable ore continues, though some of it has been found to be pyritic. From Groenfontein tin mine the profit, £3,509 6s. 10d. for the year, which has been written off the capital expenditure as last year, is lower than that made in 1912, viz., £9,704 3s. 6d., but as against this there has been abnormal expenditure during the year of over £6,000 in connection with diamond drilling, alluvial and other prospecting work, alterations to plant, etc. The policy of hydraulicing the overburden has been more than justified, as the cost of these operations has been covered by the value of the alluvial tin won in the process, in addition to which the work has led to the discovery of the "Giant Workings," which at present form the most promising feature of the mine. There is reason to hope that further similar discoveries will be made in the future.

TOPICS OF THE WEEK.

THE GREAT RAND SHOW.

There are obvious reasons why even a mining journal may take pride in the outstanding success that has attended the great Rand Agricultural Show of this week. The all-round record for size and excellence attained by this year's Show is the true mirror and index of the wonderful growth of the agricultural industry of this country, and as such cannot fail to gratify every patriotic South African. That the Show was the greatest of its kind ever held here there can be no question. All the experts, whether from this country or from oversea, unite in a chorus of commendation. The horses they tell us were worthy of Ballsbridge, the cattle of Islington, while sheep, pig and poultry exhibits bespoke a progressive factor of promising economic importance. Indeed, progress was the keynote of every department; and the increasing excellence of the farm produce displays of every description provided a unique advertisement of the possibilities of South African farming. Well might the President of the Agricultural Society, Sir Lionel Phillips—whose return to health and the Rand happily synchronised—tell his audience in his inaugural speech that for a monument to the success of this year's efforts they had only to look around them. Nor was the undertaking merely an exhibition of livestock and agricultural products. More and more the Show has each year broadened out into a great fair for the display of machinery, farm implements, motor cars, and the rapidly multiplying manufactures of the country. That, doubtless, was the aspect that suggested the reference by Sir Lionel Phillips to the great fair of Toronto, where half Canada annually foregathers for instruction, emulation and a process of periodical national stocktaking. In this respect, the Rand Show, it would seem, has been unconsciously copying Canada. Fired by the broader and bigger vision of his hopes, Sir Lionel foresees that even the present extensive showground may soon prove all too small for its increasing purpose, and he is already taking thought for "the big thing." And nothing apparently can stop the astonishing growth of this annual agglomeration of the fruits of the veld, just as nothing can now stop the irresistible onward march of the South African agricultural industry itself.

That, after all, is the important national aspect of the week's Show. Its success proves that the natural resources of the country are being turned to good account. Despite the droughts and the pests and the fears of the faint-hearted, farming is advancing. Scourges peculiar to South Africa are being overcome, the potentialities and limitations of the soil are being scientifically examined and sympathetically treated. Capital is being applied in rapidly increasing measure, and land, as a consequence, is simultaneously growing in value. All these highly desirable processes have, of course, been at work since the war, but their operation has been accelerated lately. For only of late have the patience of the modern pioneers and the scientific care of the imported expert begun to yield fruit and blossom in tangible results. Only now is South Africa beginning to feel her feet, agriculturally. She has not even yet got into her stride. And when the future historian of industry comes to weigh and appraise the influences that went to arouse South African farming from its pristine lethargy, doubtless he will apportion to the Rand Agricultural Show no insignificant share of the credit.

The Rand, of course, can "do with" whatever credit is due to it on this score. Even the most patient and uncomplaining of Randites must be heartily tired by now of the contemptuous references to our civic spirit which are the commonplaces of current criticism of the place. Surely a centre that has given such proof of its deep and abiding interest in the staple and permanent industry of the country at large can never again be accused of narrow selfishness or lack of patriotism. Regarded in this light, Sir Lionel Phillips and his associates who have done so much for agriculture have likewise and for that reason deserved well of the mining industry and the Rand. By their actions they have proved their broadness of vision, their sincere patriotism, and unaffected concern for the welfare of the whole country. Their works and attitude redound to the credit of the Rand and give the lie to the picture our enemies love to draw of a congeries of sordid rookeries run by a handful of soulless capitalists. We may, therefore, be pardoned if we point with pride to the fact that to the public spirit of our mining men equally with the perseverance of our farmers is attributable the magnificent achievement of this year's Rand Show.

HYGIENE IN MINES.

The Milroy lectures delivered by Dr. Frank Shufflebotham before the Royal College of Physicians, in London recently, deserve the widest publicity and contain much of interest to South Africa. Lack of any systematic study of occupational disease in Great Britain is a reproach that cannot easily be met, when we remember that there are funds and organisations in plenty for the investigation of tropical diseases that have a remoter bearing upon social efficiency. The Rand, as a fact, can claim to lead other mining centres in this regard. The author of these lectures lays the blame for this neglect in England in part on the medical profession. Industrial diseases, he says, have been neglected in the medical schools and by the leaders of the profession, and there are thousands of medical men working in the industrial districts of England who have never received any training in the medical schools on the diseases which they may be called upon at a moment's notice to diagnose and to treat. Under such circumstances, their experience must be gained at the expense of the patient, and—we may add—they frequently become the dupes of the skilful malingerer. It should be remembered, however, that industrial hygiene is a subject to be approached with the utmost discrimination. Whilst it is impossible to condone the ostrich-like policy of denying relationship between industry and disease, a too sedulous enthusiasm may often lead to dangerous extremes. It is a remarkable fact that several of the scheduled diseases were practically unheard of in England until the present Workmen's Compensation Act was passed. Probably the argument that the pecuniary inducement has been responsible for the increased number of cases is only partially true. Dr. Shufflebotham points out that miners are peculiarly subject to nervous complaints, and that insignificant physical injuries, to which miners are naturally liable, frequently result in neurasthenia of a pronounced type. Among people of a nervous type, the implied imminence of certain special ailments may actually induce them. It is like putting a medical work in the hands of the layman; he immediately thinks that he is assailed by every disease in the book. Inter alia, the lecturer pointed out that the laws with regard to the regulation of coalmines were revised and consolidated in the Coal Mines Regulation Act, 1911. This Act of Parliament makes special provisions for increased protection for the workmen by a more systematic method of timbering, by regulations which control the use of electricity in the mines, by restrictions with regard to the use of explosives and the methods of firing shots, and to mitigate the risk attached to haulage and shaft accidents. Provision is also made for improved ventilation in the mine, and working places where firedamp is present to a greater extent than 2.5 per cent. are deemed to be dangerous, and it is not permissible for men to be employed in an atmosphere charged with firedamp to this extent. Steps have to be taken for the prevention of coal-dust, and it is now necessary for all colliery owners to provide a sufficient supply of ambulance requisites at convenient places in the mine; and the organisation of rescue brigades is compulsory in all the colliery districts, not only for the purpose of saving life in cases of explosions, but recovering the bodies and helping to put into proper order working places that have been destroyed through the ravages of the explosion Facilities have been increased for investigating a mine after an explosion by the fact that it is now necessary for colliery proprietors to be able to reverse the ventilating current by means of their machinery on the surface. The time is yet too short to prophesy what the benefits will be as a result of this Act of Parliament, but, as far as legislation goes, it is certainly a great step in the right direction. But the occurrence of accidents and the prevalence of disease peculiar to the miner will not depend altogether upon legislation. One cannot but feel that the long death-roll year by year, and the tremendous number of non-fatal accidents are, in some instances—perhaps a large number—due to the fact that the human factor enters into these occurrences. Just as it is impossible to free a nation from drunkenness by Act of Parliament, so it is, and will be, impossible to free the miner's life from risk to injury in the same way. Carelessness or callousness on the part of either the workman or his employer may result in the greatest disasters, and in Great Britain alone it is a significant fact that if one estimates the number of deaths and non-fatal accidents, not as a percentage of the total number employed, but in relation to each million tons of coal brought to the surface, we find that in the last 10 or 12 years no improvement has taken place in this respect. It may be necessary to consider whether the mining engineer having the sole management and control of any given mine is, in view of modern science, sufficiently trained to deal with all the problems with which he may be brought into daily contact. Medical men are inclined to believe that their own profession covers as much if not more ground in the realm of knowledge than any of the other learned professions; but the competent mining engineer is daily brought in contact with problems of geology, of chemistry, of physics, of engineering, of electricity, as well as of the commercial side of his business; and perhaps the time has come for the heads of the mining profession to realise that specialisation in mining may be the means of not only working the mines to a greater financial benefit, but also of diminishing to a very large extent the number of injuries which daily take place. In conclusion, Dr. Shufflebotham said: "So much for legislation. Something further can be done, and that by the medical profession. It seems strange that industrial diseases should have been neglected in the medical schools of this country, and by the vast majority of the leaders of the profession, and that the researches in this branch of medical science have been left to individual effort. There are thousands of medical men working in the industrial districts of England who have never received any training in the medical schools on the diseases which they may be called upon at a moment's notice to diagnose and to treat. Young medical men who go straight from the hospitals to practise in these districts undoubtedly fail in many instances to realise what these industrial diseases are, and their experience, the experience of all medical men in those diseases, is gained at the expense of the patient. I do think that a great deal could be done to improve the health conditions of coalminers, and other workers too, if instruction were given at the universities and medical schools in this important branch of medical science. When one thinks of the tens of thousands of pounds that have been expended in this country upon tropical diseases (with very good results), one cannot but realise how industrial diseases have been neglected, and feel how imperative it is that this matter should have greater attention, and that young men who know that they are going to practice in these industrial districts should have opportunities of making themselves conversant with those diseases and conditions with which they will be brought into daily contact." In view of recent experiences, it would seem that the foregoing very concisely expresses what laymen on the Rand have lately been thinking.

A New Rhodesian Producer.

A new small producer which is now attracting some attention in Matabeleland is styled the Ettie, situated in the Bembesi district, and one of a small group of properties owned by Mr. R. Smith. The other mines are known as the Mirska and the Comberton, but the Ettie will be the mainstay of crushing operations, and here work has been carried down on a flat lying reef to a depth of 130 feet, values in the main winze being uniformly high. Recent work on the extensions is said to have shown high values, a total strike of 120 feet of abnormally rich stuff having been proved. The Mirska and Comberton are practically unproved. The owner intends to sink for water on the Mirska, and if that fails, to erect a battery of 1,050 lb. stamps on the Bembesi River and cart ore to that point.

REFRACTORY ORES IN THE TRANSVAAL.

Schemes of Treatment Discussed—Company to Exploit New Electrolytic Process in Course of Formation—Prospects at Barberton and Along the Murchison Range.

To most people mining in the Transvaal does not generally connote difficulties with refractory ores. This, no doubt, is in large measure due to the simple composition of the auriferous conglomerates of the Witwatersrand and its outlying limbs in the Heidelberg and Klerksdorp districts, and to the fact that the reefs operated by the Transvaal Gold Mining Estates and Glynn's Lydenburg Companies in the Pilgrims Rest district present no serious metallurgical difficulties.

The Rand's Advantage.

One of the great advantages enjoyed by the mines of the Witwatersrand has been that no ore of a refractory nature has been met with. The conglomerates from Randfontein to Geduld are amenable to simple milling and cyaniding methods, and although there are minor differences in the characteristics of ores in different sections of the Rand, such as in regard to sliming tendency, the problems that confront metallurgists on these fields are mainly mechanical, as opposed to the chemical difficulties that call for solution in other mining areas—Western Australia, for example. In the Klerksdorp-Potchefstroom areas and along the Black Reef generally the metallurgy is somewhat more complex, but even here the metallurgical difficulties attendant on gold recovery are very little in comparison with those that have to be faced elsewhere.

Mr. Garrard's Statement.

This fact is of outstanding importance when considering such a statement as is made by Mr. Jervis Garrard, consulting engineer to the Transvaal Consolidated Land and Exploration Company, in the course of his report on the operations of that concern during last year. Mr. Garrard writes: "The prevalence of refractory ores in this country has made much research work necessary with a view to obtaining cheap methods of extraction, so as to convert known unprofitable refractory ore bodies into profitable propositions. Our knowledge in this respect has been increased, and continued work in this direction may materially assist our mining industry." The statement is of very considerable importance, in that it shows that in the Transvaal despite the general erroneous impression that this is a country of free milling ores, there is abundant scope for metallurgical research. The Barberton and Zoutpansberg districts would best repay investigation along these lines.

The Barberton Area.

For instance, Mr. Garrard, elsewhere in his report, writes of the Mount Morgan mine, in the Barberton district: "No work has been carried on here during the year. A process which will cheaply and efficiently deal with the refractory ore developed has not yet been discovered." Some little while ago Mr. Morris Green carried out some very valuable researches on Barberton ores, and the results of his investigations were communicated to the Chemical, Metallurgical and Mining Society of South Africa in the shape of a most valuable and instructive paper. But apparently the hope then expressed that a satisfactory method of treating the Barberton ores would be devised has yet to be realised, and this remark applies not only to the Mount Morgan but to a number of other properties in the Barberton area of the Eastern Transvaal.

A Treatment Company.

In this connection it is most gratifying to learn that recently experimental work has been proceeding in connection with a new electrolytic process which it is hoped will change many ores incapable at present of earning profits into dividend-earning propositions. We referred to this new process some little while ago, and at an early date hope to give fuller details. We understand that at the present a company with a substantial capital is in course of formation to exploit the process, and that it will have a very extensive and valuable field for experiment cannot be doubted. Mr. Malan referred to this matter a few months ago. Speaking at Barberton, the Minister of Mines said that the treatment of refractory ores was one of the problems the outside districts had to deal with. That morning he had seen some samples of work done, and these showed most marvellous results.

The Murchison.

As to the Zoutpansberg, there are very extensive antimonial deposits carrying gold right along the range. The presence of stibnite (Sb_2S_3) should not prove a very great handicap to mining operations there, but the fact remains that hitherto it has always been put forward as one of the great handicaps of the district. In Southern Rhodesia ores in which gold occurs in association with antimony are being successfully treated at the Globe and Phoenix and other mines, and apparently there is no reason why a co-operative scheme between the smaller mines of the Zoutpansberg should not be successful. At any rate, the matter seems to be worthy of consideration.

A Novel Change House.

America, it seems, is the home of the most progressive industrial ideas, and it is an indication of the consideration now being devoted to industrial efficiency and the best means of promoting it that at some of the larger American mines the construction of change houses is being investigated, whilst in one or two instances these very necessary items of a mine's equipment are being remodelled and new ideas in hygiene and health introduced.

Thus a change house was recently built at a cost of £2,000 at the East Vulcan mine of the Penn Iron Mining Company, on the Menominee range, involving original features of design, the result of a large amount of study and thought. The principal requirements of an ideal change house, named in the order of their relative importance, seem to be: Perfect facilities for drying, warming and otherwise caring for digging clothes; suitable provision for washing off the dirt accumulated underground; a comfortable and convenient place for changing clothes; safe and convenient storage of street clothing; emergency-hospital facilities; and toilet arrangements, comprising sanitary closets, urinals and shower baths. Good lighting, heating, ventilating, plumbing, fire resistance, and good construction generally, are supplementary features.

The hoisted-hook system for handling the underground clothes was adopted. In all such previous installations, so far as known, one man's clothes are hung upon a single multi-pronged hook attached to a simple chain, not confined against swinging, and hoisted to a more or less high ceiling. The chains or hoists have been arranged in blocks comprising at least five rows between aisles. Their use has not been confined to mine clothes; the street clothes are also hung up, and one man's street clothes are often in contact with another man's underground clothing.

In this case a cupola or monitor, extending the full length of the locker room, was built and into this as a drying chamber the clothes are hoisted. Near the base of this monitor are coils of steam pipes from which quantities of dry, warm air rise through and about the clothing. The monitor is surmounted at its centre by a large ventilator, which provides for the escape of the moist air and bad adours. The monitor is about 4 ft. wide inside, and provides for only two rows of hoists, which places each row adjacent to an aisle. No street clothing is hung on these hooks.

The best "Reef Traveller" is the *South African Mining Journal.*

TIN AND COPPER MINING IN THE TRANSVAAL.

February's Record Base Metal Output—Messina Company's Good Showing—Latest Metal Market Prices.

DESPITE the shorter working time, the output of base metals by Transvaal mines during February, at a value of over £69,000, constitutes a record, but it is pretty well certain that the statistics for the month of March, which are not yet available, will show a still larger aggregate value, since there is likely to be disclosed a small increase in tin production. As to copper the Messina Copper Company, now that the railway is completed on to the mine and the new concentration plant is working at full capacity, may be expected to continue to improve on the excellent returns recently recorded.

FEATURES OF TIN PRODUCTION.

In regard to cassiterite mining in the Transvaal, the statistics of sales and shipments of tin reflect the lesser price now prevailing for this metal in comparison with the average price a year or so ago. Thus, whilst the total "sales and shipments" of Transvaal tin ore for the months of January and February of this year aggregate 701 tons, which is at the rate of about 4,200 tons per annum, as compared with a total of 3,600 tons last year, the value of this production for two months is £72,669, which is not an appreciably higher rate than that of last year, when the value was £427,863. Tin mining in South Africa is now a very live and real industry, so much so that the mines must feel the effect of any fluctuation in the prices of the metal to a fairly marked degree.

On the London Metal Exchange on Wednesday Straits Tin closed at £164 15s. per ton cash and £166 15s. per ton for three months' account. This is a lower price than was recorded either in 1913, 1912 or 1911, as the following table of prices shows:—

					Average Prices		
	Highest			Lowest	1st Half.	2nd Half.	Year.
		£		£	£	£	£
1906 ..	May	215	Mar.	161	—	—	181⅝
1907 ..	July	200	Dec.	115	—	—	174
1908 ..	Mar.	147	Jan.	118	—	—	133¼
1909 ..	Dec.	156	Feb.	123½	—	—	135¾
1910 ..	Dec.	176¾	Mar.	143⅜	—	—	157½
1911 ..	June	233	Sept.	171	192⅜	190⅜	191⅜
1912 ..	Sept	233	Jan.	188	$199\frac{3}{16}$	$219\frac{9}{16}$	209⅜
1913 ..	May	232	Dec.	166½	$219\frac{5}{16}$	$184\frac{3}{16}$	201¾

Final prices of 1913: "spot," £169¼; "forward," £171⅛.
February 6, 1914: "spot," £185⅜; "forward," £186½.

Recently the Tin Market has assumed a more interesting appearance again. A little time ago there was a determined drive against prices by speculators; and shortly before the year opened the price was forced down to below £170 a ton, on reports that the visible supply would undergo a great expansion, partly because production was increasing largely, and partly because prospects indicated an important falling off in consumption, both in Europe and America. As a matter of fact, the "bears" seem to have overshot their mark at the time, for prices, after falling to about £167 for cash early in January, sustained a wild upward rush, which in early February carried them up to about £188 for cash, from which level there has since been a considerable set-back. The speculative account has been the subject of much shuffling within recent months. The really big "bull" commitments on Continental account, which were the prime factor in evidence during the latter part of last year, and which had such poor success (having been launched at a particularly inopportune time), have to a large extent been liquidated now, some of those at the back of them having, in conjunction with influential American interests, taken the lead in running prices higher in January and early February.

COPPER.

In copper there has been a very remarkable rise in the quantity and value of production of late. The Government Department of Mines' statistics show the progressive totals of sales and shipments in the Transvaal to be as under for the past three years:—1911, 2,079 tons, value £48,237; 1912, 1,619 tons, value £49,142; 1913, 5,289 tons, value, £138,328. For the first months of the current year a still greater advance is shown: January, 1914, 907 tons, value £23,413; February, 1914, 1,494 tons, value £35,016. This progressive advance is, of course, the direct result of the expansion of productive operations at the Messina Copper Mine, in the vicinity of the Limpopo River. We understand that this property made a record output last month, and that a profit of something like £17,000 was earned.

On the London Metal Exchange on Wednesday standard copper closed at £64 17s. 6d. per ton, and, since the Messina Company commands a figure well above the average for its production, the Company will be able to take full advantage of the present good price obtaining for copper. The issued capital of the Messina Company is £165,451, so that the earning on this comparatively small financial basis should soon admit of the payment of substantial dividends.

Prospector's Action Against Apex Mines.

Another action, involving a very heavy claim, was begun in the Rand High Court this week, the amount at issue being £30,000, or 30 mining claims. The action is interwoven with a story which goes back over twenty years to the year 1893, in which year a prospector named Gauf discovered the Main Reef series on the farm Rietfontein, and pointed it out to the consulting engineer of the Apex Mines, Mr. Bouchier, and he contends now that he is entitled, under the agreement, to 30 claims, or a *quantum meruit* of £30,000. The plaintiff's declaration set out that he was a local prospector, and that, by an agreement in writing, made between both parties, dated March 28, 1893, to the effect that, in consideration of plaintiff pointing out to one Bouchier, the defendant company's consulting engineer, the outcrop of the Main Reef series on the farm Rietfontein (the property of the defendants), and on condition that Bouchier should decide that such outcrop or outcrops were sufficiently worth prospecting, it was agreed that the defendant company should (a) grant to the plaintiff a first vergunning of 12 claims, five deep (60 claims in all), after the defendant company's mynpacht and the owner's claims had been marked off, on condition of the defendant company retaining an undivided half share, with interest thereon; (b) that the defendant company should have the eventual right of floating such 60 claims; (c) that plaintiff should pay one half of the licences thereon. In pursuance of the contract, the plaintiff alleges that he pointed out the outcrop of the Main Reef series on the farm Rietfontein to Bouchier, and Bouchier decided that it was worth prospecting. The company did prospecting and had fully located the Main Reef series underlying the outcrop, and on or about November, 1909, acquired 87·05 discoverer's claims on the outcrop and Main Reef series. On March 22, 1912, the defendant company, in terms of the Precious and Base Metals Act of 1908, under which the farm was proclaimed on or about December 21, 1912, acquired a mynpacht in extent 688 morgen 589 square roods, on the outcrop and Main Reef series on the farm, but no owner's claims were marked off, as those no longer accrued to the owner under the Act. Since the passing of that Act the owner's right to grant vergunning claims no longer existed. By reason of the above, plaintiff claimed (a) a declaration to the effect that he is entitled to an undivided half interest with the defendant company in 60 claims on the farm, or, in the alternative, to 30 claims on the farm to be selected, or the value thereof, namely, £30,000, as a *quantum meruit*. The defendant company, in their plea, denied that it had entered into an agreement as stated. They admitted the acquirement of the discoverer's claims, and admitted having denied that plaintiff was entitled to remuneration from them. The case is proceeding.

City and Suburban.

The following are the details of this company's operations for March: Tons milled, 28,267; gold recovered, 11,736 fine ozs.; profit, £20,602.

ANNUAL REVIEW OF RAND MINES, LTD.

Points from the Report of the Directors for 1913. —Strong Financial Position—List of Investments Bought and Sold—Mining Interests Reviewed.

The profits for 1913 earned by the Rand Mines, Ltd., were £1,238,846 8s. 6d. Compared with the previous year, this shows an increase of £100,464 4s. 10d. This is due to an increase in profits on investments sold of £20,787 5s. 0d., and a net increase in other profits of £79,676 19s. 10d. The cash and cash assets at the commencement of the year, after deducting all liabilities, were £524,267 16s. 9d.; add profit for the year, £1,238,846 8s. 6d.; forfeited dividends, £271 6s. 0d.; making a total of £1,763,385 11s. 3d. This sum has been dealt with as follows:—Net expenditure on investments account, £233,670 4s. 10d.; dividends Nos. 20 and 21, 220 per cent., £1,169,297 5s. 0d.; balance, cash and cash assets, after deducting all liabilities, £360,418 1s 5d. Certain dividends having remained unclaimed for five years after the dates of declaration have been declared forfeited in terms of Article 122 of the Articles of Association. The following shares were purchased during the year, viz.:—10,000 £4 shares in the New Modderfontein Gold Mining Co., Ltd.; 8,060 £1 shares in the Jupiter Gold Mining Co., Ltd.; 15,290 £1 shares in the Turffontein Estate, Ltd.; 60,750 £1 shares in the General Estates, Ltd.; together with certain other interests classified in the balance sheet under the heading of "Sundry Shares." The sales were as follows:—22,000 £1 shares in the Modderfontein B. Gold Mines, Ltd.; 1,000 £1 shares in the City Deep, Ltd.; 9,000 10s. shares in the Crown Mines, Ltd.; 500 £1 shares in the Main Reef West, Ltd. The proceeds of these sales, less book value, was £128,867 17s. 10d. The following is a brief review of the results achieved in 1913 by the gold mining companies in which the company is interested:—

Modderfontein B. Gold Mines, Ltd.—Good progress is recorded by this company, which distributed dividends of 45 per cent., or 9s. per share. Arrangements are being made to increase the crushing capacity of the plant. The ore reserves are in a very satisfactory position. New Modderfontein Gold Mining Co., Ltd.—The prospects of this company continue very good. The development is highly satisfactory and the most recent working costs show a substantial reduction. Dividends amounting to 30 per cent., or £1 4s. per £4 share were declared. East Rand Proprietary Mines, Ltd.—The scale of operations and profit for the year show a reduction, attributable chiefly to the lack of native labour. A large cash reserve fund has been accumulated for the extension of development. Dividends amounting to 25 per cent., or 5s. per share, were declared. Rose Deep, Ltd.—This company paid 42½ per cent. in dividends for the year. Working costs continue low, the mine is almost fully developed and good profits should be earned. Geldenhuis Deep, Ltd.—The results for the year show a slight improvement. Dividends amounting to 17½ per cent. were declared. Nourse Mines, Ltd.—The mine has suffered from extreme shortage of native labour. Dividends amounting to 28½ per cent. were paid. This declaration covers a period of seventeen months as the financial year of the company has been altered to end on 30th June instead of 31st July. A larger number of natives would enable operations to be carried on upon an increased scale and would improve profits appreciably. Jupiter Gold Mining Co., Ltd.—In October last it was decided to close down this company, and to conserve its resources until an opportunity occurs to place the mine in a permanently satisfactory condition to work its low grade deposits. A large area of the mine is still unexplored. City Deep, Ltd.—The results for the year show a slightly greater profit. The difficulties in connection with the working of the mine have now been almost overcome, and an improvement may be anticipated during the coming year. The development of the past year has continued to disclose high grade ore, and with a better supply of native labour the tonnage treated should be increased without any difficulty and the profits materially improved. Dividends amounting to 17½ per cent. were declared in 1913. Wolhuter Gold Mines, Ltd.—Dividends amounting to 10 per cent. were paid in 1913. The development of the lower levels of the mine is promising. The Village Main Reef Gold Mining Co., Ltd.—This company again had a successful year, although the profits have fallen off. This, however, was anticipated. Dividends amounting to 70 per cent. were declared. Village Deep, Ltd.—Results were seriously affected by the lack of labour in the last six months. Development values continue good, the mine is in a very strong position, and better profits are anticipated. Dividends amounting to 15 per cent. were paid in 1913. Ferreira Deep, Ltd.—A substantial reduction has been effected in working costs, and profits show a considerable increase. The prospects continue excellent. Dividends amounting to 50 per cent were paid, as compared with 42½ per cent. in the previous twelve months. Crown Mines, Ltd.—Notwithstanding the shortage in native labour, which restricted operations very considerably, there was an improvement in working profits. Working costs, which in 1912 were 18s. 4d. per ton, fell during the year to 16s. 5d. A further reduction is confidently anticipated. The mine is in a most excellent position, and capable of supplying, without effort, the full requirements of the batteries (230,000 tons monthly) given only more labour; a marked increase in profits would be the result of an improvement in this direction. Dividends amounting to 110 per cent. were declared in 1913. Bantjes Consolidated Mines, Ltd.—The profits show a reduction, notwithstanding lower working costs. Dividends amounting to 7½ per cent. were paid. Durban Roodepoort Deep, Limited.—The results for the year show a reduction in profits. One dividend of 5 per cent. was paid The mine, which is well developed, has been greatly handicapped by lack of native labour. Main Reef West, Ltd.—The report of 30th June, 1913, shows a reduced profit. No dividends were declared during the year 1913.

THE RAND'S NEW MILLS.

Constructional Work on the Further East Rand—The Case for Nissen Stamps.

Constructional work was until recently at an absolute standstill on the Rand, but the erection of two new mills and the extension of an existing plant on the Further East Rand, together with the proposal to increase the capacity of the Sub Nigel Company's mill, should bring it home to the public at large and to engineers and mining machinery manufacturers in particular that the Rand has not yet reached the limit of its equipment, and that orders for machinery and plant are not things of the past as the pessimists would have us believe. It is of interest to chronicle the new plants now undergoing erection or in connection with which erection is about to start. The essential particulars may be expressed in tabular form as under:—

	Stamps.	Tube Mills.
Modder Government Areas ...	100	10*
Modder Deep Levels	60	6*
Modder B.	16 Nissens	1†

Sub Nigel: Increase from 4,500 to 8,000 per month capacity.

* Expected to commence crushing about end of year.

† Expected to commence crushing in August.

It is worthy of note that in February 9,100 stamps and 280 tube mills were at work on the entire Witwatersrand. Provided sufficient native labour is forthcoming, it is probable that about the end of this year or early in 1915 there will, including the new equipments mentioned above, be 10,000 stamps and 300 tube mills in employment, thus fulfilling a prediction made some years ago, which at the time it was made was considered absurdly optimistic. In point of fact that anticipation in so far as tonnage is concerned has long since been realised, for the duty per stamp to-day is very much higher than at the time the estimate was framed. The decision to instal Nissens at the Modder B. is not without interest, and reflects the confidence the engineering department of the Corner House have in these primary crushers as a result of experience at the City Deep, where a small battery of Nissens has been in employment for the past year or two. The most noteworthy Nissen equipment at work in the world to-day is that of the Shamva Mines, Ltd., in the Abercorn district of Mashonaland, where 56 Nissen heads are at work and are expected to crush 45,000 tons or more per month. This equipment is, we learn, working in a thoroughly satisfactory manner.

THE YEAR WITH THE CITY DEEP.

"Tonnage the Sole Requirement"—Need for Additional Labour—Excellent Development Results.

THE working profit for 1913 at the City Deep amounted to £285,673 1s. 4d., from which has been deducted the difference of £4,719 6s. 6d. between sundry items in the second portion of working expenditure and revenue account, a net profit of £280,953 14s. 10d. being carried to Appropriation account. This amount, with the credit on capital account for the year of £907 14s. 2d., and the balance unappropriated at the commencement of the year, £109,001 2s. 8d., makes a total of £390,862 11s. 8d., which has been dealt with as follows:—Government tax on profits, £25,002; French fiscal taxes, £1,979; interim dividends, Nos. 2 and 3, declared during year, £218,750; total, £245,732; leaving a balance unappropriated at 31st December, 1913, represented by cash and cash assets, less liabilities, of £145,130. This balance is not wholly available for distribution in the shape of dividends amongst shareholders, and is made up as follows:—Share in other companies, £8,460; stores and materials, etc., £20,909; the City and Suburban Gold Mining and Estate Co., Ltd., balance due on account of purchase of claims, £51,250; sundry debtors and payments in advance, £9,979; net cash on hand, after allowing for liabilities, £54,532; total, £145,130. In considering the above cash position, allowance should be made for the balance of capital expenditure authorised by the Board and yet to be spent, amounting at 31st December, 1913, to approximately £91,000, which includes the estimated cost of sinking No. 1 vertical shaft, the sinking and equipping of the circular shaft, and also provides for the erection of the permanent winding engine for the east incline at No. 2 shaft. The amount charged to working costs during the year for developing exceeds the amount provided by way of redemption by the sum of £632 10s. 11d., which has been written off to working expenditure and revenue acount. A further amount of £2,335 4s. 10d. has been written off under the heading of Defence of Titles, which, as you already know, is in connection with the action instituted by the Federation Company. The result of the action was entirely in our favour, and the absolute validity of our mining titles, which are all protected by Bezitrecht, was confirmed. The alleged lease on which the Federation Company based all their claims has now been cancelled. A sum of £2,374 1s. 0d., representing the balance of cost of sinking the Wolhuter Gold Mines, Ltd., incline shaft to the boundary of your property, has been written off. This expenditure was in terms of an agreement entered into by your predecessors in title in 1906, and represents the cost of certain shaft sinking required by this company in the property of the Wolhuter Gold Mines, Ltd. The sinking of the new ventilation shaft has been commenced. The total depth will be about 2,230 feet, of which 527 feet were sunk during the year. It is expected that this work, when completed, will have a permanent beneficial effect on the health and efficiency of underground workers, and will greatly improve working conditions. The main features of the operations of the company were as follows, compared with those for the previous period:—Tons milled (1912) 479,630, (1913) 468,800; yield per ton milled (1912) 35s. 6d., (1913) 37s. 6d.; working costs per ton milled (1912) 23s. 9d., (1913) 25s. 7d.; working profit per ton milled (1912) 11s. 9d., (1913) 12s. 2d.; working profit, including profit from accumulations (1912) £292,651, (1913) £296,552; payable ore reserves at end of year (1912) 2,123,650 tons at 8·7 dwts., (1913) 2,167,650 tons at 10·0 dwts. In his annual report, the consulting engineer, Mr. B. Madew, writes:—

The whole of the tonnage milled during the year was hoisted from the mine, no ore having been included from the surface dump. Owing to labour troubles experienced, the tonnage treated was considerably below the capacity of the mine and plant. Natives have been scarce throughout the year, the mine, on an average, being 2,000 boys short of its complement. Development operations, despite the shortage of labour, were not at any time during the year relaxed. Shaft sinking, for which no special allotment of natives was obtained, proceeded in No. 1 shaft, and in the east and west inclines at No. 2 shaft, the east incline being now 135 feet below the plane of the 12th level. In the upper levels the 2nd level drives east and west have advanced rapidly, exposing consistently most encouraging values, as well as the 3rd, 4th, 5th and 6th level; all points have developed Main Reef Leader of excellent grade. The 4th level crosscut at No. 2 shaft, commenced in the latter part of 1912, was completed during the year. This connection permits of the handling of materials on this level directly from the skips, whereas previously they had to be carried up from the 6th level station. The ore developed during the year amounted to 634,952 tons, of which tonnage 95·1 per cent., or 603,700 tons, are estimated to be payable, having an average slope grade of 52s. 11d. per ton. The high percentage of payability and excellent value of the ore augurs well for the company. A circular shaft, 18 feet in diameter, situated near the northern boundary of the property, between Nos. 1 and 2 shafts, was commenced in May. The complete sinking plant is erected, and the shaft, at the end of the year, was down 527 feet. It is estimated that the total depth of this shaft will be about 2,230 feet. It was necessary to sink this shaft as the present shafts were not capable of efficiently ventilating this deep level mine, and further it is my suggestion to keep your property self-contained. A fan will be erected at the top of the shaft, and all air will be exhausted through this shaft, Nos. 1 and 2 shafts acting as intakes, the air meeting in one main return-airway before ascending the circular shaft. The ventilation would be ascensional, all the gases and fumes travelling away from the workmen. The working profit realised from the treatment of current ore was £285,673, and £10,879 was obtained from the treatment of accumulated slimes; the corresponding figures for the year 1912 being £268,072 and £10,235 respectively. There were also £14,347 won during 1912 from dump rock. The increased profit may be accounted for by higher average yield per ton, the yield being higher owing to the exclusion of dump rock from the tonnage milled. The cost per ton was higher as a result of the small tonnage treated and the exclusion of surface dump rock, also the high rate of development accomplished throughout the year, the footage, being 4,385 feet in excess of that done for the previous year. The footage included a large amount of dead work, which will facilitate the handling of rock and materials, whereby future costs must benefit. The payable ore reserves at 31st December, 1913, were estimated as follows:—

		Value.		
	Tons.	dwts.	s.	d.
Main Reef Leader	2,152,000	10.0	42	0
South Reef	15,650	4.8	20	2
Total	2,167,650	10.0	42	0

The above reserves are classified as below:—

		Value.		
	Tons.	dwts.	s.	d.
1. Ore immediately available for stoping	1,696,550	10.0	42	0
2. Ore valued which will be rendered available for stoping by current development ...	181,210	8.3	34	10
3. Ore contained in shaft, boundary and safety pillars	289,890	11.2	47	0
Total	2,167,650	10.0	42	0

The stoping widths on which the above tonnages were estimated are, for the Main Reef Leader 56 inches, and for the South Reef 55 inches. Compared with the estimate for the previous year, the tonnage shows an increase of 44,000 tons, and the grade an improvement of 1.3 dwts. The excellent Main Reef Leader values disclosed throughout the year in the upper levels being responsible for the advancement in grade. The total unpayable ore developed in the mine to date amounts to 322,750 tons, having an average grade of 3.2 dwts. Of this tonnage 208,820 tons, averaging 3.6 dwts., comprises Main Reef Leader tonnage. The machinery and plant generally have been maintained in good running order, and worked satisfactorily throughout the year. Profits for the coming year could be considerably increased if native labour presents itself. The sole requirement of this mine is tonnage, and this can only be produced by additional labour.

Mr. P. W. Sherwell, the manager, writes, *inter alia*:—

The increase in working costs for the past year is largely due to the following causes: (1) No rock from surface dumps having been milled; (2) shortage of native labour; (3) increased development operations; (4) the disorganisation and unsettled feeling following on the strike of employees in July last. The policy of increasing development operations in spite of the shortage of labour has benefited the mine considerably. Not only have the ore reserves been increased, but the actual working conditions below have been very much bettered, in that we have now a sufficient number of stope faces to break all rock in one shift only. This fact alone should cause a considerable improvement in health conditions underground, and lead to increased efficiency. During the latter part of the year important connections on the 2nd, 3rd and 4th levels were made with the main workings, which greatly facilitate work and have contributed to improved ventilation in the upper levels. The values disclosed in development work on the Main Reef Leader continue to be very good, but what Main Reef and South Reef has been disclosed during the year showed poor values. The east incline, No. 2 shaft, was sunk 669 feet during the year. Stations on the 11th and 12th levels have been cut, and at the end of the year the shaft was only 55 feet above the 13th level station. Crosscutting and driving on the bottom levels will be started as speedily as possible to open up new ground. Our payable ore reserves would have shown a much larger increase, were it not for the fact that 59,405 tons declared as payable last year were found on opening out to be below the limit of payability. It is not intended decreasing the amount of development work for some time to come, provided the labour position is satisfactory. No. 1 vertical shaft has been sunk 223 feet during the year. The bottom of the shaft is now 25 feet below the horizon of the 11th level, where a station has been cut, and crosscutting to meet the drive from the bottom of 11 east 9 winze commenced. The dyke in which this shaft was left when operations were suspended there in 1908 has now been passed through. This dyke was of an extremely hard nature, and seriously affected the rate of sinking during the year. Normal ground has now been reached, and progress during the coming year will be better. The circular shaft for ventilating the upper portion of the mine was commenced in May last, the total footage sunk to the end of the year being 527 feet. Operations were delayed here in the first instance owing to our having to wait some months for the permanent sinking equipment, and, secondly, water was struck at about 60 feet, necessitating constant pumping. The strike in July upset the work of the mine in every way, and the cessation of recruiting operations was responsible for an immediate fall in the supply of native labour. Efficiency underground has been adversely affected by the constant changes in our labour force, both black and white, and while the native labour force still presents a big percentage of changes (i.e., 13·9 per cent.), the white labour force has shown a considerable improvement in this respect, the percentage of underground changes for the last three months showing 14·3 per cent. as against 21·6 per cent. for the first three months of the year. In December last this figure was reduced to 9·7 per cent. Further improvement in the health of the mine natives is also to be recorded, the average number in hospital for sickness being 0·6 per cent. as against 0·9 per cent. in 1912. There has also been a considerable reduction in admissions to hospital owing to minor accidents during the last six months. Everything possible is being done to improve health and working conditions underground for both white and coloured employees. The whole of the machinery, plant and buildings have been maintained in good order. The boiler stations at both Nos. 1 and 2 shafts are still in commission, and until all hoists are electrified, and a full supply of air is available from the Power Company, no reduction in power costs can be expected. Considerable capital expenditure was incurred during the year, particulars of which appear above. Most of the votes are near completion, except those for sinking and equipping the vertical and incline shafts. The prospects for the coming year are good. With an increase in the labour supply, it should be possible to increase both the tonnage and profit materially. With the increase in tonnage working costs must come down. The present strike, though regrettable, should not affect our position; in fact, thanks to the firm attitude of the Government, I am of opinion that much good will result in clearing away the past unrest and uncertainty and engendering a more settled feeling on this mine in the future. I desire to place on record my appreciation of the loyal manner in which the staff and many of the employees have assisted me during a particularly trying and anxious year.

THE PROSPECTS OF THE KNIGHT CENTRAL.

Shortage of Native Labour Causes Decrease in Working Costs—Development to be Expedited.

In his annual report for 1913, on the Knight Central, the consulting engineer, Mr. D. Wilkinson, writes:—The results of the past year are given in detail in your manager's report, and, while confirming the same, I beg to draw your attention to some of the more salient features. The following comparison will indicate the decrease in the yield and profit as compared to those obtained during 1912:—Tons milled (1912) 286,600, (1913) 278,010; total yield (1912) £333,877, (1913) £314,279; yield per ton (1912) £1 3s. 3·59d., (1913) £1 2s. 7·31d.; profit per ton (1912) 3s. 9·58d., (1913) 2s. 3·82d.; total profit (1912) £54,427, (1913) £32,232. The average cost per ton milled increased from 19s. 6·01d. to £1 0s. 3·49d., or 9·48d. During the first six months of the year 152,570 tons were milled, while only 125,440 tons were milled during the last six months. This decrease was caused entirely by the serious shortage of native labour during the latter period. This was also the main cause of the increase in working costs. The large longitudinal dyke was cut before the end of 1912, and has now been crosscut on the 13th and 14th levels, west shaft, and on the 15th and 16th levels, east shaft. The horizontal displacement of reef is approximately 600 feet at the west shaft and 640 feet at the east shaft. This dyke divides the claim area into two portions, viz., 182 claims north of and 677 claims south of the intrusion. The dyke occupies an area of about 36 claims in which no reef occurs. The assay results obtained on the 13th, 14th, 15th and 16th levels south of the dyke have, on the whole, been disappointing, but the latest results obtained on the 13th and 14th levels east and west show considerable improvement. The ground so far prospected covers an area of only eight claims. This area is so small as to preclude any definite conclusions as to the payable values of the reefs in the large remaining unexplored area. The ore reserves at December 31st, 1913, were estimated to be 539,100 tons of an average value of 6·0 dwts. over 60 inches, showing a decrease of 107,900 tons and a slight decrease in value as compared with December 31st, 1912. This decrease in tonnage is partly accounted for by the fact that, although there are payable sections in the drives south of the dyke, no ore has as yet been blocked out, and consequently none has been included in the reserves. As the future of the mine depends upon the values which occur in the 677 claims south of the dyke, development in this section is of the first importance, and will be pushed ahead during this year by driving on the present four levels and by sinking the two subsidiary inclines as rapidly as possible, with the object of ascertaining the value of the reef at greater depth.

Mr. F. G. A. Roberts writes, *inter alia*:—

Exclusive of shaft sinking, the footage done during the year amounts to 10,215½ feet. Of this total, 6,796½ feet or 66·5 per cent. was done on undisturbed reef, 94 feet or 0·9 per cent. on disturbed or broken reef, 847½ feet or 8·3 per cent. was not on reef, 2,098 feet or 20·6 per cent. was main crosscutting, and 379½ feet or 3·7 per cent. was done, in the first instance, as prospecting work. Inclusive of 9,263 feet of shaft sinking, the total footage accomplished since the company's inception now amounts to 94,076½ feet. The horizontal displacement of the reef, for which the Simmer dyke is responsible, has proved to be 600 feet at the west shaft and 640 feet at the east shaft. The reef south of it is at present being developed from four levels, viz., from the 13th and 14th at the west shaft, and from the 15th and 16th at the east shaft. On these levels 2,440 feet of main crosscutting have had to be done to reach the reef. With the exception of about 180 feet, all the driving south of the dyke has been confined to the South Reef. The Main Reef and Leader have been tested at intervals, and have so far proved unpayable, excepting in two boreholes 154 feet apart on the 15th level west of the east shaft. The Main Reef in these holes assayed 31·6 dwts. and 13·4 dwts. over 17 inches, and 30 inches respectively. Altogether 2,295 feet have been sampled, averaging 3·1 dwts. over an estimated stoping width of 53 inches. Included in the footage sampled, there are workable stretches aggregating 635 feet and averaging 4·8 dwts. over an estimated stoping width of 45 inches. The remaining 1,660 feet average 2·6 dwts. over 56 inches. The information so far available is too limited to permit a reasonably accurate estimate being made of the tonnage and value of the ore which has been exposed south of the dyke. The payable ore developed or exposed north of the dyke at December 31st, 1913, amounted to 539,100 tons at 6·0 dwts over an estimated stoping width of 60 inches. This reserve comprises: 228,600 tons on Main Reef at 6·4 dwts. over 59·8 ins.; 304,600 tons on South Reef at 5·8 dwts. over 60·1 ins.; 5,900 tons on Main Reef Leader at 7·1 dwts. over 36·0 inches. By classifying the blocks under various values, the following figures are obtained: In blocks averaging 4½ dwts. and under, 82,000 tons at 4·2 dwts. over 61·7 inches; in blocks averaging over 4½ dwts. to 5 dwts., 35,300 tons at 4·8 dwts. over 57.8 inches; in blocks averaging 5 dwts. to 6 dwts., 215,200 tons at 5·6 dwts. over 65·1 inches; in blocks averaging over 6 dwts. to 7 dwts., 116,800 tons at 6·5 dwts. over 56·6 inches; in blocks averaging over 7 dwts. to 8 dwts, 42,600 tons at 7·7 dwts. over 49·5 inches; in blocks averaging over 8 dwts., 47,200 tons at 9·5 dwts. over 53·1 inches. The payable ore developed or exposed north of the Simmer dyke during 1913 amounted to 126,500 tons, but approximately 37,600 tons of ore, which were included as payable in the ore reserves at the end of 1912, have been omitted from the above estimates, because the additional information now available indicates too low a value to warrant inclusion. Since the inception of the company, approximately 2,073,000 tons of ore classifiable as payable have been dealt with or remain exposed in the mine.

THE PROSPECTS OF THE ROSE DEEP.

Points from the Annual Reports—Strike and Labour Difficulties Adversely Affect Year's Results.

The following are the more important features of the year's work at the Rose Deep, as compared with the previous period:—Tons milled (1912) 782,200, (1913) 768,070; yield per ton milled (1912) 28s. 10d., (1913) 26s. 3d.; working costs per ton milled (1912) 17s. 5d., (1913) 16s. 7d.; working profit per ton milled (1912) 11s. 5d., (1913) 9s. 8d.; total declared working profit (1912) £446,824, (1913) £369,664; payable ore reserves at end of year (1912) 3,695,100 tons, at 6·1 dwts., (1913) 3,828,400 tons at 5·8 dwts. The consulting engineer, Mr. B. Madew, writes:—

The company at the beginning of the year had its full complement of labour, but a continuous monthly decrease was experienced, and by the end of June the mine was short of 655 boys. Results, however, were satisfactory for the first six months, when in July, the miners struck work. The strike was of short duration, but seriously affected the native labour supply, which decreased rapidly, the mine losing 1,285 boys in three months. The last three months produced an increase, the company being short on the last day of December of 1,230 natives. As the result of the disorganisation brought about by the strike and labour difficulties, results for the year were adversely affected. It will be noticed that the costs per ton treated, despite the smaller tonnage, are down to the extent of 10d. This is a creditable showing, and with an increased labour supply a further reduction may be looked for. The yield at 26s. 3d. per ton milled is lower than that obtained during 1912, but is more representative of the capabilities of the mine. It must be remembered that the previous year's yield included gold which had been held in reserve, equivalent to 8d. per ton milled. As the slimes plant was not capable of treating the slime produced when the mill was fully occupied, a Trent agitator, slimes collector and slimes treatment tank have been installed. It was also necessary to replace the old wooden headgear at No. 2 shaft. This has been done; the old headgear being replaced by a new one. No. 1 shaft is being converted from direct to stage hoisting The hoisting capacity of the shaft will be thereby increased, and the many accidents which occurred in the bend will then be avoided. At intervals during the year there were filled into old workings 50,725 tons of sand. Operations were interrupted on account of the sinking of No. 1 shaft. The payable ore reserves at 31st December, 1913, were estimated as follows:—

		Value.		
	Tons.	dwts.	s.	d.
Main Reef	1,602,100	5.8	24	4
Main Reef Leader	175,000	6.2	26	0
Main Reef Leader and Bastard (combined)	679,100	5.6	23	6
Main Reef Leader and South Reef (combined)	666,300	5.7	23	11
South Reef	705.900	6.3	26	6
Total	3,828,400	5.8	— 24	4

These reserves may be segregated as follows:—

		Value.		
	Tons.	dwts.	s.	d.
1. Ore in blocks fully available for stoping	3.272,800	5.7	23	11
2. Ore exposed by driving, but requiring some additional winzes or raises for convenience of stoping	154,100	6.5	27	4
3. Ore requiring some clearing of intervening caved ground	150,400	7.9	33	2
4 Ore in shaft, safety, and boundary pillars	251,100	6.6	27	9
Total	3,828,400	5.8	24	4

The above tonnages are based on stoping widths averaging 60 inches for the Main Reef, 39 inches for the Main Reef Leader, 59 inches for the Main Reef Leader and Bastard combined, 60 inches for the Main Reef Leader and South Reef combined, and 52 inches for the South Reef. Compared with the previous estimate, the tonnage in reserve shows an increase of 133,300 tons, while the value is lower to the extent of 0.3 dwt. There is, in addition to the above tonnage, 545,700 tons having an average grade of 3.0 dwts., representing the unpayable ore developed in the mine to date. Provided labour presents itself, the prospects of your company are encouraging. The underground workings generally are in good condition, the development is well established and equal to all requirements. The machinery, plant and buildings have been maintained in good order.

The manager, Mr. A. J. Walton, writes, *inter alia*:—

The average labour force employed during the year was 4,671 coloured and 622 whites, compared with 5,028 and 634 respectively for 1912. The supply of coloured labour was good during the first half of the year, averaging 5,312 employed, but during the second half the supply was very poor, only averaging 4,092 employed. The tonnage milled shows a decrease of 14,130 tons compared with 1912. This decrease is due to the shortage of natives during the second half of the year. Working costs show a reduction of 10d., and revenue a decrease of 2s. 7d. per ton. The working revenue for 1912 included 8s. per ton from a special declaration of reserve gold. The decrease in revenue is partly due to the use of machines in unsuitable stopes owing to the shortage of natives. The proportion of ground broken by large machines in stopes rose from an average of 66.2 per cent. for 1912, to 81.1 per cent. in December, 1913. The stopes near to No. 1 shaft have been filled with sand up to the 3rd level on the east side and to the 2nd level on the west side. It has been decided to convert the single stage hoisting arrangement at No. 1 shaft (compound), to a double stage hoisting arrangement, and in connection with this work the vertical shaft has been sunk to the third level and a rise started to the incline shaft, which will afterwards be opened out to form the incline ore bin. This conversion will enable the output from the section to be increased, which is necessary in view of the large proportion of ore reserves contained in the section and the probable early exhaustion of the workings at No. 3 shaft. Ore boxes have been put in at the 9th level, No. 2 shaft, and the 11th level, No. 4 shaft, No. 4 shaft has been sunk to the boundary and it is improbable that any further shaft sinking will be required. The main drives at the bottom of No. 4 shaft have made good progress and development is generally well advanced. A winze has been sunk at No. 4 section, connecting the stopes on the 1st level west with the surface where a small fan has been temporarily installed.. A ventilation connection has also been made between the 7th level at No. 1 shaft and the 9th level at No. 2 shaft, which has improved the condition of the atmosphere in No. 2 section. The number of hammer drills in use has been increased and a large machine of this type (the Leyner drill) has been employed on development with very satisfactory results. This drill uses water through the steel and entirely solves the difficulty of dust produced by drilling. Dust-allaying arrangements have been improved and every effort is being made to render the atmosphere of the mine as free from dust as possible. Large quantities of water are used for spraying and washing down faces, while a solution of molasses is sprayed in the drives, which it keeps in a moist condition for long periods. Owing to movements of ground it was deemed advisable to close down No. 3 shaft in October, for a short period. Very little damage was done and the section was restarted in December. The Power Company were unable to supply the full requirements of the mine in compressed air until late in the year, and two compressors were run until November. All the power required for the mine is now being supplied by the Power Company. In addition to the new work mentioned above the following work was done:—A Trent agitator, one slimes collector, one slimes treatment tank and a new zinc box were added to the Rose Section Cyanide Works. The fire service was completed. A new headgear was erected at No. 2 shaft to replace the old one which had become unsafe. A new pump chamber was made on the 9th level at No. 2 shaft and two three-throw electric pumps installed in it capable of delivering 6,000 gallons per hour. A new European change-house was erected at No. 1 shaft with accommodation for 120 men. The surface plant has been kept in good repair and the underground workings are in good order. The strike which occurred in July had a very serious effect on the natives and was responsible for the reduction in profits during the last half of the year.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of March, 1914:—Central Mines: Tons crushed, 12,650, yielding 8,215 730 fine ozs. Elandsdrift Mine: Tons crushed, 710, yielding 862 065 fine ozs. Vaalbock Mine: Tons crushed, 1,160, yielding 612 776 fine ozs.; Estimated value of output, £40,706; estimated profit for the month, £24,290.

WANTED.

PARTNER with £12,000 Cash to equip large low-grade Gold Property in Rhodesia.

Apply J. G. WALTER,
Golden Valley, Rhodesia.

THE POSITION OF THE GELDENHUIS DEEP.

Reduced Cost and Increased Profit per Ton Milled—Labour Shortage Adversely Affects Operations.

The following are the more important features of the year 1913 at the Geldenhuis Deep, as compared with those for the previous period:—Tons milled (1912) 627,960, (1913) 623,300; yield per ton milled (1912) 30s. 2d., (1913) 29s. 1d.; working costs per ton milled (1912) 25s. 10d., (1913) 24s. 4d.; working profit per ton milled (1912) 4s. 4d., (1913) 4s. 9d.; working profit, including profit from accumulations (1912) £141,987, (1913) £149,828; payable ore reserves at end of year (1912) 1,904,700 tons at 6·3 dwts., (1913) 1,669,500 tons at 6·4 dwts. The consulting engineer, Mr. B. Madew, writes:—When the continuous efflux of natives, which prevailed throughout the year, is considered, an increase in profit of £7,841 must be regarded as satisfactory. On the first day of January, 1913, the company had in its employ 5,998 natives, as against 3,674 on the last day of the year. At the commencement of the period under review the native labour supply was satisfactory, and the mill was fully supplied, with the result that substantial profits were obtained, but as labour shrunk so also did the profits. The yield per ton milled was lower compared with that obtained during 1912, in which yield was included £6,628 of gold reserve, a reduction in the amount sorted being also responsible for the decrease. Sorting was conducted on a reduced scale owing to labour shortage. The profit per ton was higher, made possible by a reduction of 1s. 6d. in the cost per ton treated. Most of the white employees struck work on the 3rd July, the strike was not of long duration, the majority of the men returning to work on the 8th, and the remainder on the 9th of July. Otherwise than the disorganising of work no damage was done. Development operations conducted during the year were insufficient, owing to there not being the necessary points of attack; these points would have existed had not continuous troubles been experienced in the shafts, making it impossible to open out new levels. These difficulties have now been overcome, and progress can be made, the shafts sunk, and the necessary levels opened up. The manager has in his report dealt fully with the work accomplished and difficulties experienced in the shafts. The payable ore reserves at 31st December, 1913, were estimated as follows:—Main Reef, 568,600 tons, value 5·9 dwts. or 24s. 9d.; Main Reef Leader, 508,100 tons, value 6·8 dwts. or 28s. 7d.; South Reef, 592,800 tons, value 6·6 dwts. or 27s. 9d.; total, 1,669,500 tons, value 6·4 dwts. or 26s. 11d. The above reserves may be classified as follows:—(1) Ore fully blocked out for stoping, 859,100 tons, value 6·5 dwts. or 27s. 4d.; (2) ore valued which will be rendered available for stoping by current development and sands-filling, 492,100 tons, value 6·2 dwts. or 26s. 0d.; (3) ore contained in shaft and boundary pillars, 318,300 tons, value 6·5 dwts. or 27s. 4d.; total, 1,669,500 tons, value 6·4 dwts. or 26s. 11d. The average stoping widths on which the above tonnage were based are 58 inches for the Main Reef, 40 inches for the Main Reef Leader, and 49 inches for the South Reef. Compared with the previous estimate the tonnage has decreased by 235,000 tons, the grade being slightly higher. The decrease in tonnage is mainly accounted for by the reduced scale on which development was conducted throughout the year, owing, as previously stated, to the lack of development points, and to the very low percentage of payability of the ore developed. Of the total ore developed during the year only 35·5 per cent. was payable, which is the most unsatisfactory feature of the year's operations. On the other hand, it is gratifying to note that the tonnage immediately available for stoping has only decreased by 70,000 tons, the grade being up by 0·2 dwt. There is, in addition to the above reserve, 2,184,000 tons of ore, having an average grade of 4·0 dwts. This tonnage has accumulated since the commencement of operations, and is made up of blocks between 3·5 dwts. and the present pay limit. A large portion of this tonnage, with lower working costs, will eventually be included in the reserves. Packing underground, and sands-filling were proceeded with under the South African Railways, as well as elsewhere in the underground workings. There were 85,000 tons of sand lowered into the workings during the year. The fan, which has a capacity of 150,000 cubic feet of air per minute, mentioned in my last report, has been erected at the collar of No. 1 shaft. The mine air has been greatly improved, particularly in the east section of the mine. Samples of air were taken at various points, and went to show that the ventilation was entirely satisfactory. During the year one of the two shafts on the northern section has been closed, and the other partially, pending the extraction of a very limited supply of ore, when it will also be closed. No. 1 shaft in the eastern section is now only partially in use, most of the rock being diverted to No. 2 shaft along the 15th level. As mentioned in my last report, the closing of these shafts is necessary for the more economical working of the mine. The machinery and plant were well maintained throughout the period. The ore reserve grade remains good, and there is no doubt that, with an increased labour supply, the profits earned during the current year should compare favourably with those obtained during the year which I have reviewed.

Mr. Edgar Pam, the manager, writes, *inter alia*:—

In spite of the shortage of labour in the latter portion of the year, no development faces were stopped, and the unsatisfactory footage is due entirely to lack of points of attack. The development values exposed during the year have been disappointing, especially on the West Section where large unpayable blocks have been encountered. No. 1 Auxiliary shaft was deepened a further 353 feet to a point 19 feet below the 18th level; the 17th station has been cut out and the 18th station commenced. Sinking will be resumed when the 17th level drive between Nos. 1 and 2 shafts is connected. The work in Nos. 2, 3 and 4 shafts, which were at the beginning of the year partially filled with rock and water, has been considerably delayed by further inrushes, especially during the strike in July and the heavy rains in November. Two new pumps were erected during the year, and have materially improved the position. No. 2 shaft has been cleaned to the bottom, and an ore bin and box have been put in on the 17th level; a further 40 or 50 feet will be sunk and the 18th level then commenced. Two rock skip tracks and one man cage track was renewed from the 6th to the 15th levels. De-watering of No. 3 shaft was completed in April and sinking resumed in May; owing to flooding in June and November only 214 feet were sunk to a point 72 feet below the 18th level. No sinking was accomplished in No. 4 shaft, the position at the end of the year being that the water had been lowered to a point just below the 17th level. The comparison of the ore reserve tonnage with the previous year shows a decrease of 235,000 tons, but a satisfactory feature is the large tonnage converted from non-available to available ore reserves, with the result that the available ore reserves show a decrease of only 70,000 tons. The labour shortage, with resultant spare capacity of plant, accounts for the reduction in the percentage of waste sorted. The average labour employed on the mine during the year was 709 whites and 4,922 coloured, as against 727 whites and 5,696 coloured for the previous year. The electrification of the remainder of the plant was completed during the year. All machinery and plant has been maintained in good order and condition. It is satisfactory to note a further decrease in the number of fatal accidents during the year, the figures for the last three years being as follows:—

	1911.	1912.	1913.
Number of deaths	39	34	20
Rate per 1,000	4.8	5.3	3.6

It gives me much pleasure to place on record the loyal manner in which the members of the staff have performed their duties.

Zaaiplaats Tin.

March results: Days run, 27·8 days; ore milled, 3,786 short tons; residues re-treated, 2,122 short tons; concentrates won, 100 long tons; average value of concentrates, 66·3 per cent. metallic tin; estimated profit for the month, excluding Government tax on profits, £4,152 9s. 3d.; less adjustments in respect of estimated values of previous shipments, £533 4s. 3d.; profit declared for the month, £3,919 5s.; capital expenditure, £401 3s. 4d.

SAND-FILLING AT THE WIT DEEP.*

Detailed Description by Mr. E. E. Hardach of a Successful System.

SAND-FILLING was started on the Wit. Deep over two years ago, principally for the purpose of relieving the pressure on partly worked out areas and of supporting the roof while reclaiming the pillars and other reef left in the old workings, and is being extended to follow up more closely to the current stope faces. It has materially lessened the number of air or pressure blasts in the mine, and enabled us to recover nearly all the pillars in the old areas so far worked over. The surface plant, which, including the borehole, cost £7,620, consists of a system of belt conveyors under the sand treatment vats (so arranged as not to interfere with the track haulage to the dump) which delivers the sand into a sluice box, with a grade of 20 per cent., to the suctions of two 6 in. Robeson sand pumps. One of the pumps delivers the sand to a steeply inclined winze for filling in the south section of the mine, and the other to a 6 in. borehole 780 ft. deep for filling the north section of the mine. 8 in. screwed piping is used for deliveries, and 9 in. and 10 in. cheaper quality pipes are laid out 1 ft. below the surface, and at a grade of about 1½ per cent. towards the pumps. The deliveries are 1,200 ft. and 1,400 ft. long respectively, and they show no signs of wear, and have given no trouble from choking, except on one occasion when one of them had been several months out of use. Water is circulated for about half an hour after we stop pumping sand. There are 6 dewatering cones at the winze and 6 at the borehole. To convey the sand through the deliveries, from 2 to 3 times its weight of water is used, and the underflow from the cones contains about 30 per cent. moisture. Each cone will handle about 10 tons of dry sand per hour. Only current sand has been used; and to 31st January, 1914, 328,615 tons had been put in the mine at a surface cost of 3·82d., and an underground cost of 3·74d., making a total cost of 7·56d. per ton of sand filled. The surface costs include discharging the sand from the treatment vats, running and maintenance of conveyor belts, pumps, cones, and water lost at 7½d. per 1,000 gallons. The underground costs include all timber, matting, launders, and labour required for putting in the stulls to retain the sand and for supervising the filling. The sand from the winze is conveyed underground in launders with a minimum grade of 15°, when it is necessary to deflect it a considerable distance laterally; when this is not required it is allowed to run on the footwall. Deflecting stulls made of 4 in. uprights, wedged in place and lagged and covered with a strip of jute matting, have been found cheap and serviceable for deflecting the sand for two or three weeks. The upper portion of the mine has a dip of 55°, and when the sand is run in launders at this grade they wear rapidly, but at 15° they do not show much sign of wear. In the steep portions of the mine, and where it is desired to keep a level open permanently, the pillars above the level are thinned down to 5 ft. or 6 ft., and the box holes closed with stulls, lagging, cocoa-nut matting, and the sand filled in above. Where a level is not required to be kept open more than two years, or where the dip is less than 40°, we take out all pillars and run a line of stulls 15 ft. or 20 ft. above the level, lag, mat, and fill with sand. We have tried jute matting, but have not found it satisfactory as it does not allow the water to filter through freely, and is liable to impound water behind the stull, which, when sufficient has collected, will break through and perhaps cause a serious accident. We have no difficulty in retaining the sand in the steep portions of the mine as it seems to set very firmly, but we have always taken the precaution of putting in substantial stulls in the steep wide stopes where it was desired to work below the sand-filling.

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*Paper read by Mr. E. E. Hardach before the Chemical, Metallurgical and Mining Society of South Africa.

THE OUTLOOK FOR THE NIGEL.

Last Year's Profits up to Expectations—New Manager's Candid and Straightforward Report—The Prospects for 1914.

THE report of the Nigel Gold Mining Company, Ltd., for 1913, to be submitted to the meeting at Natal on the 28th May, states that anticipations with regard to profits for the first half of the year under review were realised, and the directors were enabled to pay off the company's indebtedness to the bank before 30th June and declare a dividend of 5 per cent. at that date, after which, as intimated in last year's report, the whole of the profits were available for distribution. The profits for the latter half of the year were also up to expectations, and, as foreshadowed by the Chairman at the annual meeting, a dividend of 10 per cent. was declared at 31st December, making a total distribution of 15 per cent. for the year 1913. The profit and loss account submitted may be summarised as follows:—Gross receipts for the year, £239,429; total expenditure, £190,518; profit for the year, £48,911; add balance from previous year, £33,979; forfeited dividends, £81; available balance, £82,971. This balance has been applied as follows: Dividend (No. 34) 5 per cent., dividend (No. 35) 10 per cent., profits tax, £2,600; depreciation written off £12,671; balance to next year, £34,234. As shown in the balance-sheet, depreciation has been written off as follows:—Plant and machinery, 10 per cent., £8,003; permanent works, 10 per cent., £2,297; buildings, 10 per cent., £2,154; live stock and vehicles, 10 per cent., £150; furniture, 10 per cent., £38; farm implements and fencing, 10 per cent., £25; total amount written off, £12,671. The following items of capital expenditure were incurred during the year:—Plant and machinery, £2,131 11s. 11d.; buildings, £54; less sales live stock, £20; leaving £2,165. Mr. L. E. de Villiers, who held the position as acting manager from 1st July to 31st October, 1913, during the absence on leave of Mr. Curnow, was appointed manager and assumed control of the mine on 1st November last. The new manager, in his report, writes:—

> "I am of opinion that improvements can be effected, and my earnest endeavours will be centred in so conducting operations as to secure the best results the mine is capable of yielding, and I am not without hopes that the year's work will show fair returns, although not equal to those of last year, owing to the ever-increasing demands of the Miners' Phthisis Board and other expenditure beyond my control. Residues, in my estimation, are far too high, and I recommend the hanging up of 20 stamps and the erection of another tube mill. The adoption of this course will not materially affect the tonnage dealt with, but will be the means of giving a finer product, more suitable for cyanide treatment and consequent increased extraction, and at a lesser cost than is possible by stamp milling. The cost of an extra tube mill will be about £3,000. I find our present output of electrical power is insufficient for requirements owing to the increasing depth of the shafts, which naturally necessitates the provision of extra pumps; this is especially the case in the Rand Nigel section. The provision of extra plant to remedy the position will cost about £2,500, and the new installation will be carried out, if approved of, to allow for considerable expansion. The extra tube mill and the extra electrical power plant, costing in the aggregate about £5,500, will, so far as I can see at present, be the only capital expenditure of any consequence required during the year. Under existing circumstances I fear it will be impossible to continue the rate of profit returned during the past year, but if my scheme of an extra tube mill be adopted I see a probability of maintaining it somewhere near last year's figures."

"FIRST AID" AND AMBULANCE COMPETITIONS.

A Popular Precedent.

The first annual ambulance competition, open only to employees of the Crown Mines, Ltd., will be held on that company's property on Sunday next, the 19th inst. In order to further the interest of their employees in first aid and ambulance work, the directors of the Crown Mines are offering a prize of £30 to the best underground team, a further prize of £30 to the best surface team, while in order to ascertain which is the best ambulance team on the property, an additional prize of £15 will be given to the best of the two winning teams. Thus it is possible for the best team of five men to win altogether £45, or £9 per man. The competition will be held under the auspices of the South African Red Cross Society, and will commence at the South Rand shaft at 9 o'clock next Sunday morning. A knowledge of first aid and ambulance work is of the greatest value to all, both men and women, and particularly so to those working on the mines, where, despite every care and precaution, accidents are continually occurring. The Mining Regulations provide that certain officials must hold ambulance certificates, but these are of little value unless the holders have frequent practice both in the theory of first aid work and in bandaging. The management of the Crown Mines, bearing this fact in mind, have instituted an ambulance corps on their mine, which is under the control of its medical officers, who are assisted by experienced men who have been appointed ambulance officers, one or more of whom are promptly on the spot whenever an accident occurs. So far as is know the Crown Mines and the Neumann group of mines are the only mines at present who have offered particular inducements for first aid work to their workers by means of prizes and trophies. The Chemical, Metallurgical and Mining Society and the Transvaal Coal Owners' Association have three shields open for general competition by mine workers who are the holders of any ambulance certificate. The employees at the Modderfontein Dynamite Factory have an annual competition for a trophy presented by the company, while the St. John Ambulance Association have several shields, which are, however, only available for competition by members of their own brigade. In this connection the prizes for the best "Safety First" devices or methods of procedure, and for ambulance equipment to be exhibited at the Mining Exhibition to be held next month, which are being presented by the Rand Mutual Assurance Company and the South African Red Cross Society deserve the utmost publicity, and it is hoped that much good will be achieved as a result of these competitions.

THE E.R.P.M. POSITION AT A GLANCE.

Sir George Farrar's Summing Up of Position and Prospects—The Life Question—Improved Financial Position as Net Result of Two Years' Work—Reduced Dividend Probable.

Sir George Farrar presided at the annual meeting of the E.R.P.M. on Thursday, and thus described the position and prospects:—

Summing up the operations for the year in a few words I should say, taking your property from the Cason shaft west, to the Driefontein boundary, a distance of two and a third miles along the strike of the reef, comprising by far the greater proportion of the mine, the development for the year shows the satisfactory result of 66 per cent. payable ore developed. East of the Cason shaft the results are disappointing. Looking back on the history of the Cason, and with the knowledge that at one time it was one of the highest grade sections of your property, one would have hoped for a recurrence of good values, but, so far, there is no evidence of it. I may say, however, that the 19th level, which has been driven 3,350 feet east, of the Cason shaft, shows the payable value, over the last 730 feet, of 6.6 dwts. over 50 inches. Working costs gradually fell In the month of June the satisfactory figure of 18s. 10d. was reached. Had it not been for the unfortunate set-back due entirely to the July strike, I feel sure that working costs during the remainder of the year under review would have been maintained at this figure.

RECENT DEVELOPMENTS.

I now come to the results of development operations for the early part of this year. They are eminently satisfactory. Driefontein.—Development has been much curtailed, but the values have kept up. On the 21st, 23rd and 24th levels, 482 feet of driving gave an average value of 11.4 dwts. over a reef width of 51 inches. Angelo.—All development is giving very good results. The 336 feet of driving towards the Driefontein on the 23rd, 24th and 26th levels has an average of 15.3 dwts. over 68 inches, and for 283 feet of driving towards the Comet on the 22nd, 23rd and 24th levels, the value is 14.0 dwts. over 49 inches. The width and value of reef in the 26th west drive for the last 57 feet is 76 inches giving 6.6 dwts. Comet.—Recent development in this section shows a marked improvement on the 22a and 23rd drives, which have advanced 515 feet since the year end. A value of 8.7 dwts. is disclosed over 69 inches. The Phoenix winze, which for a depth of 730 feet has averaged 8·5 dwts. over 52 inches, will be holed with the rise from the Angelo Deep within the month. Cason.—The 19th east drive has continued payable, averaging 6.9 dwts. over 38 inches for a distance of 233 feet. Other development points, with the exception of the 22nd East Phoenix, are discouraging. Angelo Deep.—The 25th east drive has averaged 6 dwts. over 68 inches, and confirms the view that the ground from here through the Comet will be of good value and stoping width. Hercules.—Recently good widths and values have been exposed on the 28th level. On striking the reef, 129 inches gave a value of 9.6 dwts., since which 35 feet of driving exposed 64 inches, value 7.3 dwts. The 29th east and west drives still continue in unpayable ground, though the compact nature of the reef and the values obtained above and below give promise of improvement. The reef on the 30th level, has just been exposed, though too recently to allow of much driving. The value for a distance of 31 feet is 15.3 dwts. over 43 inches.

THE LIFE OF THE MINE.

In regard to the life of the mine, I have received several letters from shareholders asking me to touch on this question. With the major portion of your claim area undeveloped and the existence of such varying factors as the flattening of the dip of the reef, and probable upthrows of which we already have had profitable experience in the upper portion of the mines, variations in stoping widths, fluctuations in the percentage of payability, future costs of working and the vexed question of the limit of depth at which mining can profitably be carried on, it is impossible to give an exact forecast. While we are not prepared to bind ourselves to specific figures, the superintending engineer and the board are of opinion that profitable mining on your property will not cease within the next twenty years. The board in its report directs your attention to the paramount importance of increasing the scale of development operations, but to achieve this we are being greatly hampered by the scarcity of natives, and we have been compelled to transfer a considerable proportion of our best labour, from stoping to development. Should, therefore, the supply not materially improve I cannot see that the last year's rate of profits will be maintained. This was foreshadowed in the superintending engineer's report. It is somewhat early in the year to prognosticate, but I am afraid that shareholders during the current year must be prepared to accept a lower rate of dividend. At the end of last year, on the termination of his agreement, Mr. H. Ross Skinner relinquished the position of superintending engineer, and Mr. Anderson, formerly your general manager, was appointed in his place, Mr. E. C. J. Meyer taking over the duties of manager. To these gentlemen, and to the rest of the staff, all of whom worked well and loyally for the company throughout a troublous year, the thanks of the shareholders are due. During the last two and a half years I have devoted practically the whole of my time to the affairs of your corporation. I need a rest, and I leave this month for a holiday, but I hope to return towards the end of the year. Looking back at the net results of the last two years, especially after the criticism directed against the stability of the mine some two and a half years since, I think they are not unsatisfactory. What are the results? I will tell you:—

We paid our shareholders	£1,222,948
We put back into the property out of profits ...	389,000
We improved our cash position by	48,000
We have accumulated cash to replace the diminution of the ore reserves amounting to	228,231
We have redeemed debentures to the face value of	150,000

These figures speak for themselves. (Applause.)

Mr. J. L. Ganf moved a resolution proposing that the board should not buy the debentures of the company in the market and that the debentures should be repaid at par by annual drawings.

There was no seconder. The appointment of Mr. A. G. Gill as a director of the company in place of Mr. E. Wolfes, resigned, was confirmed. Messrs. Julius Friedlander, Gustav Imroth, and Jules Jourdan were re-elected directors. Messrs. C. L. Andersson and Co. and A. E. Page were re-appointed auditors.

OIL SHALE MINING.—III.*

A Detailed Discussion of an Industry of Great Potentiality in South Africa from the Investor's Point of View.

[By J. F. KELLOCK BROWN.]

THE following is a continuation of our article of last week:—

The crude oil is sent to the refinery sometimes along with the product from several crude oil plants, where it is first distilled in boiler stills, arranged in series and each giving off a distillate of fixed specific gravity. Between the series of distillations the oil is agitated in acid (sulphuric) and an alkali (soda)—separate treatments—and the acid and soda tars removed, while the oil goes back for its second distillation. Fractionising or dividing into the various grades at each distillation follows, and the boiler stills are arranged to give oils of the required specific gravities. The heavy oil and paraffin obtained from the last still go to the paraffin house, where they are exposed to cold, causing the paraffin to crystallise out, and the scale is collected in cloths in hydraulic presses. The solid paraffin requires refining, carried out in the paraffin refiner by a process of cooling and sweating the scale, being finally treated with charcoal and filtered.

As already stated with reference to mining costs, costs of manufacture are subject to variation, based on (a) position, (b) country, (c) production. Position and country have the effect already discussed, and production has its bearing on the question in relation to the degree of refinement practised. The cost of operating a works which only produces crude oil is less than in one which carries its processes to the last stages of refinement, and markets several special brands of burning and lubricating oil. But on the other hand, the total price realised upon the products is greater in the last case than in the first, and the matter is mainly one of adjustment to suit the market to be supplied. On average results the cost of manufacture might run as follows: Crude oil process, 1s. 6d. per ton of shale. Refinery oil process, ¾d. to 1¼d. per gallon of crude oil. Sulphate of ammonia process, 1s. 9d. per ton of shale.

COMMERCIAL.

Knowing that workable beds of oil shales exist, the success of an oil-shale industry depends: (1) On the ability or failure to discover flowing wells; (2) on the internal markets available; (3) on the cost of mining, producing and reaching the market.

(1) Discussion of this point is a subject of geological importance, but it should be understood how vital any decision is to commercial success. A shale venture commenced in the centre of an oil-field, say one of the Californian fields, would be an utter failure, and proportionately as the distance between the oilfield and the shalefield increases, so does the possibility of a successful ending to a shale undertaking increase. Oil from the drilled field has a greater market radius owing to the lower production costs; somewhere intermediate there is a point at which both oils can meet at even competitive prices, and the further away the shale works are from this point the greater will in turn be their market radius.

(2) The commercial products of manufacture are: (a) Naphtha; (b) burning oils; (c) intermediate oils; (d) lubricating oils; (e) paraffin wax and candles; (f) still coke; (g) sulphate of ammonia.

(a) Naphthas can be obtained according to requirements, and work's practice, at various specific gravities determining the grade, 0·660 for gasoline, 0·690 for motor spirit. Ordinary naphthas from 0·725 to 0·745. The first two products are used for power purposes, and the ordinary grades for lighting, as solvents, and in the manufacture of such goods as oilcloth and linoleum.

(b) Burning oils are used for lighting and heating purposes, and are produced in various grades for different classes of consumption.

(c) Intermediate oils mainly used for gas-making purposes and power use.

(d) Lubricating oils are used either alone, or are mixed with vegetable oils. Numerous extra refined grades are sometimes made.

(e) Paraffin wax, mainly made into candles, is also used for paraffin wax match heads, and waterproofing.

(f) Still coke is a high grade carbon used for electrical purposes and as drawing-room fuel. It gives a hot glowing fire without smoke or much ash.

(g) Sulphate of ammonia finds a ready market as a fertiliser.

(a), (b) and (c) find their best market in highly populous districts, (d) demands a manufacturing area, and (g) an agricultural country. Thus different products are suitable for various markets, and it is but seldom that all these conditions are present at the doors of the shale works. The market question, therefore, requires to be thoroughly investigated. The presence of undeveloped water power will sooner or later deal a heavy blow to the profitable production of oils for power and burning purposes. On the other hand, the scarcity or high price of coal or wood fuel is a favourable factor. Under modern progress gas-enriching is not attempted to the same extent as formerly, and therefore intermediate oils are only of value for gas-enriching in those countries where gas is chiefly used for purposes of illumination. Still coke forms only a small proportion of the total products, and owing to its qualities would find a certain market anywhere. Sulphate of ammonia as a fertiliser is of great and increasing value agriculturally, its consumption is growing, and it is largely exported. Candles are used mainly in rural districts, where the total market may be considerable, but widely scattered. The manufacture of a crude oil suitable for power purposes possibly gives the greatest scope for large and increased markets in the future. That day, however, is not yet, and it would be folly to consider entering into shale-oil operations with a crude oil production as the sole object in view, unless an assured source of disposal was available.

A new and developing country without any discovered flowing oil-fields offers the greatest chance of oil-shale success, and commercially the venture becomes the more risky the older the country and the closer to natural wells. Tariffs are artificial aids to encourage internal production. A study of market conditions includes a knowledge of the class and proportions of refined products to be sold, area of distribution, population and industries, and a consideration of future competition.

(3) The cost of mining and production has already been discussed. Cost of reaching the market is either a question of rail or road carriage, and is determinable on each delivery of oil. Usually it is borne by the consumer, but where wagon delivery has to be undertaken in a scattered territory, it must be looked upon as a running expense, and therefore an item in the cost sheet. The value of any shale can readily be reckoned on the current prices of the finished products.

GENERAL.

In any oil-shale venture the formation of a preliminary development company has much to recommend it, the object being thorough investigation of the conditions on tho ground. Quite possibly it is desired to commence under favourable but new conditions this well-known chemical industry, and there is everything to gain and nothing to lose by a little cautious investigation at the commencement of the work. Capital requirement can only be estimated on particular conditions, but where good oil shales have been discovered, good prices obtainable and a steady and increasing market, there can be a capital return up to 50 per cent. and over, nor at the latter figure should the enterprise be looked upon as highly speculativo. It is a result already gained and maintained by existing companies, where an investor's capital is as reasonably secure as it can be in any conservative mining enterprise.

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*Read before the Western Branch of the Scottish Federated Institute of Mining Students.

Messina (Transvaal) Development.

The March operations of the Messina are as follows:—Mill ran for 26·2 days and treated 6,575 tons of ore, equal to 250 tons per day. Smelting furnaces ran continuously during the month and treated 413 tons of middlings. Total production was as follows:—Mill concentrate, 1,332·16 tons; average assay value, 40 per cent. copper; smelter matte, 97 tons; average assay value, 65 per cent. copper. Total, 1,429·16 tons; average assay value 41·6 per cent. copper. 401 tons of 10 per cent. copper middlings, together with 644 tons from accumulated stock were re-ground and treated during the month, producing 150 tons of 28 per cent. copper concentrate, included in above. Lilliput coal mine produced 300 tons of coal, all of which was used for smelting purposes. Development footage for month amounted to 316 feet, at 4th 6th, 9th and 10th levels. Erection of new headgear at No. 5 shaft is practically completed and new winding engine has been tested under steam. Coal fuel is now used for entire boiler plant. An ample water supply is now obtained from the Zand River pumping station. Concentrate and matte shipped during month, 1,361 tons.

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THE EXPLOITATION OF BIG LOW-GRADE DEEP LEVELS.

More Lessons from Alaska—History of Development of Large 2½ Dwt. Mines.

To the present generation of miners the group of three mines on Douglas Island has been the outstanding example of the successful exploitation of a big deposit of low-grade gold ore. The Rand is cited with variable confidence as the type of uniformity of yield over a wide extent of lode, but for profit wrung from economy of operation the Treadwell group is still the expression of triumphant mining engineering. The three Treadwell mines, namely, the Alaska Treadwell, Alaska United, and Alaska Mexican, all on the same lode, have yielded 54,000,000 dollars in gold from an average return of 2·55 dollars or 2½ dwts. per ton, at a cost of 1·50 dollars per ton, to a depth of 1,750 feet. Plans now being put into effect will increase the tonnage treated daily to 7,500, together with a confident and systematic development to a depth of 3,000 feet. This is being done under the direction of Mr. F. W. Bradley, who, when comparatively a boy, achieved wide distinction by making a record for cheap exploitation. So long ago as 1887 at the Spanish mine in Eldorado County, California, he mined and milled a soft ore body at a total cost of 63 cents per ton. The mine was an open-cut, and the reduction plant consisted of four Huntington mills, but the achievement was a faithful forecast of the bigger things he was to accomplish in mature manhood.

The scheme outlined by the new control was an enlargement of that originally suggested by Mr. Pearse. His first milling unit was to have had a capacity of 2,000 tons; Messrs. Holden and Jackling proposed to start with 6,000 tons daily. Mr. Pearse estimated a stoping width of 60 feet, averaging 2·20 dollars, to be worked at a cost of 1·25 dollars per ton; his successors expect to stope an average width of 70 feet of ore averaging 1·50 dollars, at a cost of 75 cents. per ton. This estimate was not based upon ordinary sampling, which in a lode of this size and grade is impracticable, but upon the yield from 600,000 tons taken from three different large stopes. The main ore body was estimated to be 4,500 feet long, the plan of development including the driving of an adit from Sheep Creek on the lode at an average depth of 2,200 feet below the outcrop, or about 700 feet deeper than the old workings. This has now been done. The adit, 8 by 10 feet in section, was driven as much as 570 feet in one month, namely, last June. The confidence necessary for such comprehensive operations was given by the records of the mine, the apparent continuity of the big ore body, and the successful results obtained at Treadwell. On the evidence available at that time—early in 1912—it was assumed that 50,000,000 tons of ore were "definitely indicated," and on this basis the property was deemed a "bargain" at 12,000.000 dollars, provided that the necessary capital was available. Eventually it is expected to treat as much as 20,000 tons per day or 7,000,000 tons per year. This compares with the biggest consolidations on the Rand as follows: Randfontein Central, 8,000 tons; Crown Mines, 6,000 tons; and the East Rand Proprietary, 5,500 tons per day.

Meanwhile an enterprise of similar character was being developed on the Alaska Juneau mine, which adjoins the old Perseverance on the north. Here the engineers are Mr. Bradley, to whom reference has already been made, and Mr. Robert A. Kinzie, the resident manager of the Treadwell mines. The late Capt. Thomas Mein was interested in this property, and with him at one time were associated Wernher, Beit & Co., but the interest of the latter has passed from them. Operated during the short summer months only, the Alaska Juneau earned meagre profits from a 1·25 dollar ore, and could hardly be regarded as a winning venture. It became evident that only exploitation on a large scale with a big mill near tide-water could wrest an assured profit from this wide lode of low-grade ore. Both at this mine and the old Perseverance the heavy snow-fall and severe climatic conditions prevented economic operations in winter; it became necessary to abandon the attempt to open the mine from surface and, instead, to pierce the lode by an adit from Gastineau Channel, the strait—a mile wide—dividing the mainland from Douglas Island. Thus the engineers of both the Alaska Gold Mines and the Alaska Juneau projected deep-level adits connecting the workings underground with big mills on the shore. The Alaska Juneau adit is 6.538 feet long to the point where a rise extends vertically to the surface, 800 feet overhead, and on the hanging-wall side of the lode. If driven in the lode itself to its outcrop this rise would be 2.000 feet long. By the time this connection is made the first milling unit of 30 stamps will be ready to treat some of the richer ore, so as to contribute toward further development, and at the same time another 10-stamp mill will begin a series of crushings to test the ore exposed in the workings and to ascertain the best system of metallurgical treatment. The lode cut by the adit is 500 feet wide and averages 2 dollars per ton. This yield is better than that from the surface workings, but it is believed that it will be maintained for "considerable distances both longitudinally and vertically," for a 30-stamp mill has been working for five months each year for fifteen years on ore extracted from open-cut workings. It is now estimated, by Mr. Bradley, that an average recovery of 1·45 dollars per ton can be obtained from an output of 6,000 tons per day, at a cost of 80 cents, to be decreased when the operations are matured to a daily output of 12,000 tons.

As affecting both of these undertakings, it may be stated that Mr. J. R. Mitchell, the former superintendent of the Perseverance and a particularly capable man underground, applied the caving system successfully and indicated that 100 tons of ore could be broken per machine drill shift, as against an average of 31 tons in the Treadwell mines. This difference is due to the unlikeness of the lodes, that in Silver Bow basin being characterised by quartz lenses and stringers in schist with a distinct parting along the foot-wall, while that on Douglas Island is a tough diorite penetrated by quartz veins without any selvage on either wall. The Juneau-Perseverance lode-matter, when broken, will disintegrate on exposure to the air, so as to crumble into pieces small enough to pass down the chutes and into the tram-cars, while the ore of the Treadwell lode, after being blasted, has to be drilled and dynamited into smaller pieces and reduced further with sledge-hammers. The chief items of cost on a basis of 6,000 tons daily, compare as follows:

	Treadwell.	Silver Bow.
Mining	95	40
Milling	25	20
Concentrate treatment	8	7
Construction, etc.	12	13
	$1·40	$0·80

The main difference is in mining, this being due to the fact that development work, stoping, and general expense together amount to 72 cents per ton at Treadwell, and only 24 cents at the two big mines on the mainland. Again, tramming, hoisting and pumping are estimated at 23 cents in the one case, and only 16 cents in the other. These figures would not be worth quoting in this magazine if they were taken from an ordinary prospectus or even from a report by an inexperienced engineer; coming from Mr. Bradley they have a technical value and an economic interest not to be gainsaid.

Adjoining the Alaska Juneau on the north another big enterprise is being developed, on the Ebner properties, by the United States Smelting and Refining Company. Ore bodies of similar character have been exposed, and arrangements have been made to equip and operate the mine on a scale similar to the two other companies southward. The Ebner was worked for fifteen years by a man of that name, who proved the existence of large reserves of ore yielding 1·80 dollars per ton for a width of 60 feet. An adit now being driven will cut the lode at a depth of 1,200 feet below the surface.

If the plans outlined above are put into effect, as seems certain, the Juneau district will yield 20.000.000 dollars gold per annum from the treatment of 12.000,000 to 15,000,000 tons of ore. Undoubtedly the establishment of such an industry in this part of Alaska will lead to intensive exploration all along the schist belt of the coast range. It will involve an advance in the technique of mining engineering as applied to big bodies of low-grade ore, and it will be accompanied by sundry innovations in metallurgical treatment, which, speaking broadly, will be modelled more on American disseminated copper practice than on that of gold milling in California, Australia, or South Africa.—From the *Mining Magazine.*

Stavoren Tin Annual Meeting.

The first ordinary annual meeting of shareholders in the Stavoren Tin Mining Company was held in the company's office, Pietersburg, last week. The Chairman, Mr. A. A. Auret, read the report of the directors, which stated: Your property consists of the quitrent farm Stavoren No. 18, in extent 2,124 morgen 185 square roods, in the district of Waterberg. A plan of the mining area, underground workings, situation of the dams (which were built during the period under review), battery and buildings will shortly be prepared and will be open for the inspection of shareholders. The share capital of your company remains the same, but during the year 1,400 reserve shares were issued. The issue was at £2, as shareholders insisted on the right given them by the articles of association to take up reserve shares at that figure, and consequently your directors were prevented from availing themselves of the market value at which your shares stand to-day. The issued share capital is now £14,200, and there are 1,800 shares held in reserve. It gives your directors great pleasure to report that the erection of the reduction plant, consisting of a five stamp battery, with the necessary tables, etc, is nearly complete, and it is anticipated that crushing will be started shortly. From the manager's report it will be seen that approximately 600 feet of sinking and 300 feet of driving has been done during the period under review, and there are 3,040 tons of ore ready to be milled. The management continues under Mr. N. McWilliam, who has given every satisfaction. The balance sheet showed that the capital of the company amounted at 31st December last to £14.200 (16,000 shares of £1 each, less 1,800 held in reserve). Share premium account amounts to £1,400, bond on farm £7,000, share calls account (amount paid for call in respect of issue of further 1,300 shares) £1.259, and sundry creditors £643 9s. 7d., making a total debit account of £24,502 9s. 7d. On the credit side the chief asset shown is the farm Stavoren, £17,382 12s. Reduction plant (at cost) is stated at £2,154, plant and machinery £323 19s. 2d., dams £331 12s. 6d., buildings at mine £55, loose tools £44, livestock and vehicles £83 12s., payments in advance £140, sundry debtors £62 6s., cash £904 4s. 3d. The expenditure and revenue account shows that £1,334 14s. 5d. was paid for native labour to date, and £1,184 4s. 6d. in wages.

DOMINIONS COMMISSION AND RAND MINING CONDITIONS.

More Points from Mr. Schumacher's Evidence—Life of the Rand—80 per cent. of Total Tonnage Still Untouched—The Drink Question—Housing and Trading on Mining Ground.

In our last issue we discussed at length the interesting statements made to the Dominions Commission by Mr. R. W. Schumacher on the question of Rand unification. The remarks made on the same occasion by Mr. Schumacher on the burning question of the life of the Rand were not less interesting. In concluding his evidence, Mr. Schumacher said:—"I wish to emphasise one point which was touched on by Mr. R. N. Kotze, in his evidence before this Commission. The estimate prepared by the Transvaal Chamber of Mines for the recent Economic Commission of 550,000,000 payable tons still to be worked referred only to the tonnage in the present producing mines on the Witwatersrand and down to an assumed vertical limit of 7,500 feet. Mr. Kotze has given the interesting information that his own estimate is in the neighbourhood of 580,000,000 tons, and he added, further, that he calculates roughly that there is likely to be an additional quantity of 580,000,000 tons from other areas so far unexploited, notably, I think, on the far eastern fringe of the Rand. His total estimate is, therefore, approximately 1,160,000,000 tons payable ore still to be treated on these fields or in their immediate vicinity. It is interesting to note that only about 280,000,000 tons have been mined on the Rand between the time of its discovery in 1886 and the end of 1913. According to Mr. Kotze, about 80 per cent. of the tonnage is therefore still untouched."

Illicit Liquor.

Mr. Schumacher then spoke strongly on the evils of the present illicit liquor selling on the Rand. "If the Commission could help us to get this finally stopped," he said, "it would be doing a really great service to the Witwatersrand. I venture to suggest that in no other direction could the Commission help us more. The regulations at present leave loopholes which ought not to exist. I append extracts from the Liquor Licensing Ordinances of 1902 and 1906. The position, which is most unsatisfactory to-day, is in danger of becoming worse. For years great pressure was brought on the Government of the Transvaal, and has also evidently been brought from time to time on the Government of the Union of South Africa, to abolish total prohibition of the sale of liquor to natives on the Witwatersrand and to encourage the sale of the so-called light Cape wines. In fact, the Government has been urged to undertake the sale of these light wines itself. I say confidently that no measure could be introduced here with more disastrous effects as regards the health of the natives or as regards the safety of the white women and children who live in close proximity to them. An important section of this community has more than once asked for what is known as local option, or the right of local veto. I contend that it is monstrous that this should not be accorded to them. In no place in the world is it more necessary that the people on the spot should be allowed to direct, control or suppress the liquor traffic.

Trading on Mining Ground.

"I enclose memorandum containing information on this point, prepared by Mr. S. C. Steil, one of our joint secretaries. Many of the trading licences were granted in opposition to the wishes of the mining companies. There is no doubt that it would be very much better for the native if these trading stores ceased to exist; where necessary, compensation should, of course, be given. The difficulty of dealing satisfactorily and rationally with this matter appears to have been always exaggerated. Members of the Commission have seen the report of Surgeon-General Gorgas, in which he recommends the erection of villages for natives on the mines. I shall be pleased to answer any questions on the subject that the Commission may wish to put. Nothing could, of course, be done in a hurry, and any commencement should be made on a small scale.

Housing the Whites.

"We have taken a keen interest in this subject. A model village was started last year on one of our mines—the City Deep, Ltd.—where the men will have an opportunity of obtaining, on very advantageous terms, full possession of the properties as soon as township rights have been granted to the company. It is expected that these rights will be received within the next few months. It will be seen from the conditions, copy of which I enclose, that a number of rebates are offered to men who remain in the employ of the company, or who have large families of young children. It is further laid down that once a man has entered into possession of one of these houses, he may remain there as long as he continues to pay his instalments, no matter if he continues in the employ of the mining company or not. He could leave the employ of the company on the day following his entering the house, and yet remain permanently in possession of the house. This is a privilege which, I believe, has so far not been accorded elsewhere. It is intended to help to settle good workmen on these fields."

MINING MEN AND MATTERS.

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 20th April, 1914, at 8.15 p.m. Business: The minutes of the ordinary monthly meeting held on the 23rd March, 1914, will be read. The following papers will be open for discussion: "Notes on some Prehistoric Stone Implements found in Katanga," by F. E. Studt, A.R.C.S.; "The Granite Dykes of the 3,520 ft. Level, Kimberley Mine," by E. H. L. Schwarz, A.R.C.S.; "Outlines of the Geology of German South-West Africa," by Eberhardt Rimann, Ph.D., M.E.M.Sc.; "The Occurrence of the Brazilian Trilobite *Pennaia* in the Bokkeveld Beds," by S. J. Shand, D.Sc., Ph.D.; "Note on Graphite-Coated Diamonds from the Premier Mine," by P. A. Wagner, D.Eng., D.Sc. The following papers will be read:—"Metasomatism in Banket," by R. D. Young, D.Sc.; "The Geology of a Portion of the Belingwe District of Southern Rhodesia," by P. A. Wagner, D.Eng., D.Sc.

It is really astonishing, says the Middelburg paper, the amount of work that has been accomplished at Uitkyk Collieries in the short space of time it has been working. In addition to the machinery, sidings have been laid, a loco. installed, bunkers erected, headgears put up—and a hundred and one things done. The compressor—the largest this side of Johannesburg—is immense; in fact, everything about the place is on a big scale. The latest addition is a tremendous bunker, laid down specially to cope with the export trade. There is no doubt that Mr. J. G. Howard, the genial general manager, has worked hard to accomplish what he has in so short a space of time, and we hope his efforts will receive the reward they deserve, and that a big export trade will be built up in this district.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Shortcomings of the Prospector in South Africa.

To the Editor, *South African Mining Journal.*

Sir,—You have allowed various "Fossickers" to have their say; perhaps you will permit an investor to ask a few questions. Imprimis, I may say that my little speculations extended from the Vaal River to the Zambesi, and I make no distinctions between the fossickers of either the Transvaal or Rhodesia, the latter lot, if anything, suffer more from "swelled head" than their brothers in the south. As a result of these speculations, I am in a position to ask the following questions, and if "Fossicker" cannot place the cap on the right head, there are others who can. Who was the prospector sent to the north-east to peg off base metal claims and who slept for some weeks on the verandah of the local hotel, with intervals for "refreshments" until his employer's money was finished? Who was the prospector who was sent north with money to pay natives and who was discovered in the nearest town with no money and a fit of D.T.'s? Who was the prospector who received an order to purchase mealies, and having done so promptly carted them to the next store and exchanged them for—well—not tea or coffee? Who was the prospector who cleaned out an old shaft in a remote part of the country and reported every week a certain footage sunk and drew money for it until his measurements equalled the depth of the shaft? Who was the "capable" prospector who trekked 200 miles with specimens of rock containing staurolite under the impression he had tin ore; and who was the prospector who brought in some common opal and reported an abundance of precious opal which proved on investigation to be only "blue John"? Out of the many I have given only a few instances, and am quite in agreement with the comments of "Another Fossicker," and hope we will soon get rid of the useless crowd who have been fattening on the public for so many years, and with them that detestable option-monger who is still with us. The subject you have raised, Sir, has been a fruitful theme of discussion for many months, and one definite conclusion has been arrived at: that is, we are not giving money to any more prospectors to go picnicking. There are still a number of men carrying well-polished specimens in their waistcoat pockets, or 2 oz. propositions in an old tobacco bag, and they will be well advised to hide them away until the "mug" comes along. As confirming "Another Fossicker's" remarks, I will conclude with the following extract from an editorial in the *Mining Magazine* for March: "The day of the illiterate digger is gone; the ore bodies that outcrop in plain sight have mostly been found; the search for mineral wealth has passed to the man who can make scientific deductions." So mote it be.——Yours, etc.,

A ONE TIME MUG.

Johannesburg, 14th April, 1914.

Native Labour Recruiting.

To the Editor, *South African Mining Journal.*

Sir,—From a telegram in the Press it appears that the Director of the Native Labour Bureau has been airing his views before the Dominions Commission in Johannesburg, and if correctly reported then all I can say is that his evidence is not borne out by facts, in so far as it affects recruiting on the mines. It is absolute nonsense for Mr. Pritchard to say that the natives are in the hands of the traders and that recruiting interferes with voluntary labour coming forward. Mr. Pritchard is reported to have said that recruiting is demoralizing; but this must be taken for what it is worth, as whatever might have occurred years ago in regard to the methods of recruiting, the present-day methods will compare quite as favourably as those of any other line of respectable business. It is absurd to say that recruiting interferes with voluntary labour, as the natives themselves prefer going through the labour agent for many sensible reasons. Anyone with any knowledge at all of the conditions surrounding the native labour supply question can, with perfect honesty say that the voluntary system spoken of by Mr. Pritchard is utter rot. It was tried before, with the result that the only people who benefited were a number of overpaid officials who sat about in various offices waiting for natives to come along to them. According to the Press information Mr. Pritchard further said that the traders belittled the authority of the Government in the eyes of the natives. This might be his opinion, but is it based on fact or is it merely an inference, because the average trader with a fair sprinkling of brains will not bow and scrape to every whim of the Director of the Government Native Labour Bureau. What the labour agent demands is that in return for the licence money the Government demands from him, he should be allowed to conduct his business under the provisions of the Labour Recruiting Act, without being interfered with at every turn or corner by stupid regulations, which are issued from time to time. In like manner the native who contracts with a mine, through the labour agent, seems to have all his trouble—not with his employer, but with the Government, or shall I say with the Native Labour Bureau. It seems fairly clear that an amendment to the Native Labour Recruiting Act is absolutely necessary in the direction of lessening the powers of interference by the Director of the Native Labour Bureau in contracts and other matters, which affect the contracting parties only. Regarding the condition of matters on the mines in respect of the natives, all I can say is that there is nothing to complain of as far as the native himself is concerned. It is a native's nature to grumble, no matter how well he is paid and treated; but the general opinion expressed by all natives when they come home is that they have nothing to complain of. This is borne out by their letters to their friends. It is common knowledge that the mines are short of labour, and naturally people are curious to know the cause. This is not far to seek. The administration of the Labour Act is almost entirely responsible for the disorganised state of the labour supply, and until the Act is amended matters will go from bad to worse. Trusting that I have not trespassed too much.—Yours, etc.,

X. Y. Z.

Mining in the Murchison Range.

To the Editor, *South African Mining Journal.*

Sir,—The history of Murchison Range mining is not encouraging, and the claim-pegging optimists of a dozen years ago and more have long since deserted the district: the few remaining white inhabitants are now pessimists. It is obvious that the opening of the Selati Railway through the heart of the field is not alone sufficient to bring the long-looked-for boom, which is perhaps as well, for what is really wanted now is some steady development work to show that a boom may be justified after all. Notwithstanding its history of failure no disinterested mining man who visits the district can fail to be struck with its evidences of mineral wealth; the outstanding fact is that the Murchison Range is not dead because the "stuff" is not there. Like many another isolated mining field it has suffered the effects of a boom founded on exaggerated reports of untold wealth, and it has never recovered. Rhodesia has been strong enough to fight down the evil results of wild speculation, but not so the Murchison Range. Again, when the Murchison is mentioned one hears of the deadly climate, the isolation and the lack of water. The climate is certainly very hot and trying in summer, but it is doubtful if malaria would be as bad on the Murchison hills as, say, in the Hartley district of Rhodesia. It is certainly not nearly so bad as in the low-lying region through which the Selati Railway is now being continued towards Messina. This railway has, of course, removed the isolation difficulty, and the water question is a comparatively small one, with the Selati River supplies available for smaller operations and the immense resources of the Oliphants River for larger schemes. It should be clearly understood that while there are many of the "pockety" reefs, generally regarded as only suitable for the small man, there is also scope for base and precious metal mining on a large scale. The most important occurrence of the latter class is the so-called "antimony belt." This is a line of quartz gold-bearing reefs which has been traced over forty miles east of Gravelotte. Its special feature is the association of sulphide of antimony with the quartz. The presence of this mineral makes the treatment of the ore for gold recovery a very difficult problem, but by no means an unsurmountable one, as has been proved in other countries—notably France. Chiefly owing to the excellent work done recently at the Weigal and United Jack mines, there is strong evidence to support the view that shoots of ore occur along the "belt," which are easily rich enough to pay even with a complicated method of treatment. A much better knowledge of the real nature of these reefs is now available from the work done on these properties. To the north of the "antimony belt" there is evidence of more or less continuous lodes of copper and zinc ores. Practically no recent work has been done here, but there is undoubtedly a great opportunity for an exploration company to open up the ground. At the base of the southern line of kopjes known as the Murchison Range there are numerous quartz reefs, which so far have proved to be of the "pockety" description. It is from these that most of the gold produced from the district in the past has been won. The Bluejacket, the La France, and the Sutherland Reef mines are now closed down, but those who know these properties also know that the reefs have never been properly explored, and the closing down of these mines is no proof of exhaustion. On the Oliphants River, south-east of the range, the deposits of mica and corundum have been spasmodically worked for some time, but here again the small amount of capital available has been largely frittered away in claim-pegging and payment of licence monies. What is badly wanted for the district is a powerful exploration and prospecting company established for legitimate mining, and not simply for the purpose of obtaining huge stretches of country for speculative purposes. Such a company working in such a highly mineralised field would have prospects as good as in any mining field in the world. In addition a well organised scheme of Government backing for the smaller fry, such as obtains in Western Australia and elsewhere, would be of great benefit, but one looks in vain for such enterprise from the Union Government. Finally, parties sending engineers to the Murchison Range must beware of the influence of the Rand. The problems of the Low Country are entirely different and more numerous, the possibility of failure is far greater, and it requires a strong man to resist the temptation to condemn when he knows what the result of failure may be to himself.—Yours, etc.,

"OUTSIDER."

The Plight of the Prospector.

To the Editor, *South African Mining Journal.*

Sir,—As a prospector with just a few years (12) to my name in Rhodesia, Cape and the Transvaal, I note your correspondents have quite a rub at the seeming ignorance of the prospector. Admitted for argument's sake he is ignorant and a boozer of the first water, which reputation he mostly gets when his luck has been in and he has sold a little proposition after months of shortcomings, and is not in a position to take his liquor like our engineers who come up to inspect the results of our toils, and in some cases starvation, loaded with luggage so well known amongst us all. No, I wish to look at it from another standpoint, and that is a general lack of sympathy to the prespector—I mean financially. How many good propositions in the country are going begging for want of capital and a helping hand to prove a likely thing when discovered? What, again, about locking up huge areas of alluvial deposits in portions of Northern Transvaal which would furnish a happy hunting ground for the broken-down prospector to furnish funds for fresh efforts? I personally can point, out of many, two reef propositions with average pannings from a few dwts. to 7 or 8 ozs. in good country, but can you get in touch with support? No. Nowadays you must sink and open up about 300 ft. of work to convince them, and can the average man do this? Take another of my own finds—98 odd carats of diamonds discovered in alluvial terrace wash; can I get capital for machinery and pumps? No. And how many are in my position after years of work, and who having sunk our last penny into the game, have to turn to the railways and such for a job; as one of your correspondents writes. He is on a good wicket and off to other climes to rub shoulders, but is he really, or is he one of those gentlemen paid touts? No, there are yet splendid fellows at the game, but they want support by a more generous gold law and open prospecting. All alluvial deposits are the right of the public. I claim the main principle, work it or quit, and the unlocking of large areas already held, Customs mills dotted in likely country and less of the so-called text-books. Although I have a fair working knowledge of geology and an eye for country, yet it never pointed out to me anything so good as when I wander with my gun and go where my eye takes me. I will admit it reads well when you have discovered and in comes the geologist with his report, but do not forget that is secondary, as it is no use till the gold or other mineral is struck. Don't run us down and sneer when we have to turn to the railways and similar institutions for funds to carry on with, but use you influence, Mr. Engineer and Geologist, and support us with grub instead of kicks, and get this big country unlocked and opened up. We have not all got country bars mapped on our brains, as usually I for one have been far from the bar or an engineer transport waggon either, and I am only one of many and have many a time existed and kept on working by bartering game shot for meal, and so been enabled to carry on, paving the way for the consulting engineer in later years.—Yours, etc.,

H. H.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of March, 1914:—Tons crushed, 3,813; yielding 1,874 fine ozs.; estimated value of month's output, £7,875; estimated profit, £1,165.

Apple Growing in Tasmania.

Orcharding in Tasmania is a long-proved investment, giving a net return of about £35 per acre—equal to 50 per cent. per annum on capital invested—when orchard is in full bearing. Owing to the fine climate, lovely scenery and pleasant social conditions, it is particularly suitable for those contemplating retiring from mining work. We plant and manage for absentee owners, with extended payments, under Government expert supervision. We are managing for over 40 absentee owners, many of whom have visited Tasmania and have personally investigated the industry and our absentee system. Land situated on fine navigable waterway. Pamphlets, giving full particulars as to capital required, profits, etc., forwarded on application to our representative, Mr. J. P. Johnson (for many years on the Rand, and now settled on our Kelso Estate), who can be interviewed at the Grand National Hotel, Rissik Street, Johannesburg.—Messrs. Sadleir & Knight, Orchard Agents and Attorneys, Launceston, Tasmania.

Rhodesian Section.

LATEST MINING NEWS.

The Antelope—Labour for the Congo—Shamva Trial Crushings—Susanna Mines—Rhodesia, Limited—Cam and Motor—Rezende Mines.

All development work was suspended on the Antelope mine during the December quarter in order to concentrate labour on preparing the mine for milling. The ore reserves at the end of the year were, in consequence, less than at September 30 by the small tonnage mined and crushed during November and December. The total reserves at date were 155,232 tons of an estimated value of 10·15 dwts.

* * * *

A new source of labour is being tried by the Union Minière at Lubumbashi, they having recruited some 350 boys in Portuguese East Africa, whence they were shipped via Port Amelia to Beira, and taken on there by train. Mr. Ling, who was in charge of them, declares that they were recruited in a fortnight, and were in no way "picked." They are physically a fine crowd, and many of them are old Rand hands.

* * * *

A telegram was despatched from Bulawayo in mail week to the Shamva Mines, Ltd., in London, stating that the trial crushing to date has been quite satisfactory. Assays or residues show that the extraction will be better than had been anticipated, while the yield of the ore which is being milled more than confirms, it is stated, the value of the assay plan. It is expected that the full capacity of the mill will be reached after the erection of the other Dorr tank, which should be completed early next month.

* * * *

Susanna Mine: Twelfth level, drive south 4 ft. from south wall of spur reef; drive reef 19 ins wide, 6 dwts. per ton, evidently big body of payable ore. Lady Lina: Fourth level east drive, sump 17 ft. from crosscut sunk 2 ft. in reef, assaying 9·6 dwts. Fourth level west drive extended to 19 ft. 6 ins. from crosscut; hanging wall section assay 12·4 dwts. over 19 ins. Long John Claims: Reef cut about 36 ins. wide, assaying 10·8 dwts.; located payable rock in a trench 150 ft. north in line of strike.

* * * *

Rhodesia, Limited: Cablegram from Bulawayo in mail week: "During February, 81 ft. of development have been executed at the Sabiwa mine. Kopje section, shaft No. 4, sunk 13 ft. during the past month, making a total of 439 ft.; 4th level drive south, winze No. 1 to 5th level, down 94 ft. below No. 4 level. There is no change to report. 3rd level drive south, winze No. 2, to 4th level, sunk 9 ft. during past month, total 71 ft. Average assay value over section of reef exposed 1 oz. 2nd level drive south, winze No. 2 to 3rd level, sunk 20 ft. during past month, total 95 ft. Average grade over section exposed 17 dwt. Expenses have been reduced. Have concentrated labour on penetrating intrusion."

* * * *

The London and Rhodesian Mining and Land Company, Ltd., Secretaries for the Cam and Motor Gold Mining Co., Ltd., have issued a circular to the shareholders in the last-named company, dated London, March 12th, which reads as under:—I am instructed to inform you that a cable has been received from the manager in a mutilated condition. The Board have cabled for verification of the doubtful words including the tonnage, and this with any additions will be notified through the Press. The trial crushings were completed on the 28th February, the bullion recovered being £16,643, including £800 in slags; the estimated value in solution being £266. The cable states that the bullion recovered would have been greater but for leakage of gold solution in the plant when starting treatment, and also absorption of gold during the period. Advices by mail state that the tonnage being treated was much below the capacity of the plant due to numerous stoppages for necessary alterations and adjustments. The cable states that the plant has been closed down since 28th February, but re-started yesterday, the adjustments and alterations having been completed. The manager is of opinion that the plant should be giving very much better results during April and approximating the original estimates. Latest reports state that the mine is looking well.

* * * *

Rezende Mines: The following details were published with the announcement of the February output:—The total profit of £2,501 shows an increase of £102 against January, the output of 2,171 ozs. being, however, smaller by 181 ozs.; the Rezende section yielded a profit of £2,116, a reduction of £230 as compared with January. The tonnage milled was 4,100 tons, a decline of 300 tons, and as the gross yield was smaller by 2s. 0½d. at 31s. 0½d. per ton, while working costs were reduced by 1s. 7½d. to 23s. 8½d. per ton, the average profit per ton was only 5d. per ton lower at 7s. 4d. The Old West workings yielded during the month an estimated profits of £615; the Penhalonga section yielded a profit of £385, against only £53 for January; 9,300 tons were milled, a decrease of 400 tons, the average value of the ore being 8½d. per ton higher at 7s. 8¼d., but as the working costs were ¼d. per ton lower at 6s. 10¼d., the average profit was 8¾d. greater at 10d. per ton.

Rezende Mines.

The results for the month of March, 1914, are as follows:—Estimated profit: Central Section, £1,681; Old West Workings and Penhalonga Section, £1,066; total, £2,747.

Rhodesia and Union Farms and Mines.

The directors' first annual report submitted at the first annual general meeting of shareholders held on the 27th March, 1914, shows that the company was registered under the limited liability laws of the Transvaal, on 31st December, 1912. The capital of the company is £67,250 in 269,000 shares of 5s. each, all of which were issued to the subscribers at par. The property of the company consists of 23 freehold farms and portions of farms, situate in the Transvaal and Bechuanaland. The sum of £15,224 on loan at call is available for working expenses.

New S.A. Companies Registered in London.

TATI COMPANY, LIMITED.

Tati Company, Ltd., has been registered, with a capital of £400,000 in £1 shares, to take over the undertaking and all or any of the assets and liabilities of the Tati Concessions, Ltd. (incorporated in 1895); to carry on the business of miners, explorers, metallurgists, concessionaires, etc.; and to adopt agreements (1) with the liquidator of the said old company, and (2) with Snell & Swaffield, relating to underwriting. The minimum subscription is 20 per cent. of the shares offered. The first directors are: A. D. Fairbairn, G. B. Tydd, S. Clay, A. Adams, and C. V. Thomas; qualification, £1,000; remuneration, £150 per annum (Chairman, £200), free of income tax, and 5 per cent. of surplus profits in each year when 5 per cent. dividend is paid, divisible.

THE WEEK IN THE SHAREMARKET.

Mexican Trouble the Restraining Feature—South African Stocks Steady—Good Undertone.

The local market has been quiet this week, interest having gravitated towards the Agricultural Showground. In London the Mexican trouble has been a restraining feature in all markets, and South African stocks, of course, suffered with the rest. The news from America is, however, more hopeful at the time of writing, and it looks as if the horizon were now fairly clear. With the passing of the holiday spirit, Rand stocks are bound to come in for increased attention, and more activity is generally anticipated for next week. Among tin and diamond stocks the market has been quiet. Harrisdales have been the only feature on their improving tin prospects.

* * * *

	Tues., 7th	Wed., 8th.	Thurs., 9th.	Tues., 14th.	Wed., 15th.	Thurs., 16th.
Adair Ushers	0 5*	—	—	0 5*	0 5*	0 5*
African Farms	13 9*	13 9*	13 11	13 9*	13 7*	13 6*
Apex Mines	19 6*	19 6*	19 3*	19 0*	19 9†	18 0
Bantjes Consolidated	14 0*	14 3*	14 0*	—	—	—
Benoni Consolidated	—	1 10*	—	1 10	1 9*	1 9*
British South Africa	18 3*	18 6*	18 0*	18 0*	—	—
Bushveld Tins	0 6*	0 7*	0 7*	0 7*	0 7*	—
Cassel Coals	15 0*	15 0*	15 0*	15 0*	15 0*	15 0*
Cinderella Cons.	6 0†	5 9	—	—	—	—
City and Suburbans	48 0*	48 0	47 9*	—	47 9*	47 0*
City Deeps	63 0	65 0†	65 0	64 6*	64 9*	64 0*
Cloverfield Mines	4 6*	4 6*	4 4*	4 8*	4 8*	4 6*
Clydesdale Collieries	9 0*	9 0*	—	9 0*	9 0*	9 0*
Cons. Investments	21 0†	19 0*	19 0*	21 0†	—	19 0*
Cons. Langlaagtes	—	30 9*	32 3*	31 6*	32 6*	—
Cons. Main Reefs	17 6*	18 0	17 9*	17 9*	17 10*	17 10
Cons. Mines Selection	—	—	—	7 0*	9 6†	7 0*
Coronation Collieries	21 0†	21 0†	18 0*	21 0†	—	—
Coronation Freeholds	0 4*	0 4*	0 4*	0 4*	0 4	0 4*
Coronation Syndicates	—	—	4 0*	—	—	—
Crown Diamonds	7 9*	8 0†	—	—	8 0†	8 0†
Crown Mines Debentures	£98*	£98*	—	—	£98*	£95*
Durban Roodepoort Deeps	—	—	—	16 6*	18 6†	—
East Rand Centrals	2 0*	2 2	2 0*	2 2*	2 2*	2 1*
East Rand Coals	1 8*	1 8*	1 7*	1 7*	1 8*	1 8*
East Rand Deeps	1 6*	1 8*	1 7*	1 6*	1 7*	—
East Rand Props.	36 0*	35 6*	..	—	36 0*	37 0
East Rand Debentures	£83*	—	—	—	—	£83*
Eastern Gold Mines	1 2*	1 2*	—	1 1*	1 1*	—
Ferreira Deeps	50 0†	—	50 0†	—	—	—
Frank Smith Diamonds	5 4*	5 3*	5 0*	5 0	4 6*	4 6*
Geduld Props.	24 6*	24 0*	24 0*	24 0*	—	—
Geldenhuis Deeps	25 0†	25 0†	—	—	—	—
General Minings	—	—	10 0*	—	—	—
Ginsbergs	17 0*	17 0*	17 0*	—	17 0*	17 0*
Glencoe (Natal) Collieries	6 6*	6 9	6 6*	6 6*	6 6*	—
Glynn's Lydenburgs	—	11 6†	—	—	—	—
Government Areas	20 3	20 6	20 3*	20 6*	20 9	20 3*
Jupiters	—	4 9*	4 9*	5 0*	—	—
Kaalfontein Diamonds	—	—	—	—	—	0 5†
Klerksdorp Props.	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Knight Centrals	9 9*	9 8	9 6	9 8*	9 9*	9 6*
Knights Deeps	—	33 0*	—	34 6*	37 0*	37 0*
Lace Props.	3 3*	3 4*	3 4	3 3*	3 4	3 3
Luipaardsvlei Estate	9 9*	9 9*	10 0*	10 0*	10 0*	—
Lydenburg Farms	—	2 7*	2 7*	2 7*	2 7*	2 3*
Main Reef Wests	7 0*	7 0*	7 3†	7 9†	7 9†	6 0*
Main Reef West Debs	—	—	—	£70*	£70*	—
Middelvlei Estates	1 1*	1 1*	1 0*	1 0*	—	1 0*
Modderfontein B.	—	—	—	81 6*	—	80 0*
Modderfontein Deeps	45 0*	45 3*	45 6*	45 9*	46 0	45 9
Natal Navigation Colls.	15 0*	15 0*	15 0*	—	—	—
New Boksburgs	1 0*	1 0	0 9*	—	—	0 9*
New Eland Diamonds	26 0*	—	29 0†	28 0†	—	—
New Era Cons.	5 6*	—	5 6*	—	5 9*	5 9*
New Geduld Deeps	1 11*	1 11*	—	1 10*	1 10*	1 9*
New Gochs	12 6*	12 6*	12 6*	12 6*	12 6*	12 6*
New Heriots	—	—	58 0*	—	59 0*	60 6*
New Kleinfonteins	23 6*	23 3*	23 0*	23 3*	23 3*	23 0*
New Modderfonteins	245 0*	247 6*	248 9*	250 0*	250 0*	250 0*
New Unifieds	—	17 0†	—	—	—	—
Orange Diamonds	1 6†	1 2*	1 6†	1 3*	1 0*	—
Piggs Peak	10 0*	10 0*	10 0*	10 0*	10 0*	—
Pretoria Cements	45 0†	45 0†	—	44 3	44 0*	45 0
Princess Estates	—	—	4 6*	—	—	—
Rand Collieries	—	—	—	—	1 0*	—
Rand Klips	2 6*	2 7	2 7	2 6	2 7*	2 7

*Buyers. †Sellers.

	Tues., 7th.	Wed., 8th.	Thurs., 9th.	Tues., 14th.	Wed., 15th.	Thurs., 16th.
Rand Nucleus	1 8*	1 8*	1 8	1 8*	1 8*	1 5*
Randfontein Deeps	3 3*	3 4	3 4*	3 5*	3 3*	3 3*
Randfontein Estates	22 3*	22 6*	22 6*	22 9*	23 6	—
Roberts Victors	—	—	—	—	—	20 0*
Robinson Deeps	—	28 0*	28 0*	—	—	—
Rooiberg Minerals	25 0*	25 0*	25 0*	25 9*	25 9†	24 0*
Rose Deeps	—	—	—	44 0*	—	—
Ryan Nigels	3 0†	3 0†	3 0†	3 0†	—	—
Shebas	4 6*	4 6*	—	4 6*	4 6*	—
Simmer Deeps	2 3*	2 3*	2 3*	2 3*	2 3*	2 3*
S.A. Breweries	—	40 0*	—	40 6†	41 0†	—
S.A. Lands	3 0*	3 0*	3 0*	3 0*	3 1	2 10*
Springs Mines	14 3*	14 9	14 3*	14 0*	13 9*	13 6
Sub Nigels	11 6*	13 0†	11 0*	11 0*	11 0*	11 3*
Transvaal Coal Trust	29 0*	29 0*	29 0*	—	29 0	29 6†
Transvaal G.M. Estates	39 3*	39 6	39 0*	—	39 0	—
Tudors	1 0*	—	—	—	—	—
Van Ryn Deeps	44 0*	44 6	44 6	45 0	45 0	45 0
Village Deeps	—	—	37 0*	37 0	36 0*	—
Vogelstruis Cons. Deeps	—	0 9*	1 0*	—	—	1 0*
West Rand Cons.	7 6*	—	8 0*	8 0*	—	—
Witbank Collieries	43 6*	43 6*	43 6*	44 3	46 0†	43 6*
Witwatersrands	—	69 3*	69 0*	69 0*	69 6*	—
Witwatersrand Deeps	52 0*	52 9*	53 6*	—	54 3*	53 6*
Wolhuters	15 6	15 3*	15 3*	15 6	15 6*	15 0*
Zaaiplaats Tins	27 6	27 0	26 9	27 3	25 6*	25 0*

*Buyers. †Sellers.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

May 6.—Van Dyk Proprietary; Lancaster West; Tudor; Modder Deep Levels; Geduld Proprietary; Princess Estate; May Consolidated (annual).

May 15.—Bucks Reef (special); Marievale Nigel; Wit. Deep (annual).

May 20.—Apex Mines, New Kleinfontein (Annual).

May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).

May 27.—Consolidated Langlaagte Mines; Ginsberg; Glencairn; Government Areas; New Primrose; New Rietfontein; New Unified; Van Ryn Deep; Witwatersrand G.M. (annual).

May 28.—West Rand Consolidated; Roodepoort United; New Goch; Meyer and Charlton (annual).

May 29.—Cloverfield; Vogel. Deep; Knight Central (annual); Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries; Sacke Estates (annual).

June 2.—Modder. B.; Bantjes (annual).

June 3.—Crown Mines; Durban Roodepoort Deep; Village Deep (annual).

June 17.—S.A. Gold Mines; Leeuwpoort Tins; African Farms.

June 22.—Robinson Deep (annual).

June 23.—Transvaal Consolidated Lands (annual).

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Engineering Notes and News.

The "Heintz" Steam Trap.

As now manufactured the Heintz steam trap is the most perfect appliance of its kind extant, succeeding where all others fail. Wherever steam is used a trap means economy, and the greatest economy follows the use of the Heintz. It is perfectly automatic and requires no attention or regulating, and is applicable everywhere that steam is employed for heating or power. Each trap is thoroughly tested and overhauled before leaving the works, and a full guarantee is given. It is further claimed for the Heintz steam trap that it is suitable for any pressure up to 200 lbs. per square inch; requires no adjustment or regulating; is wide open when starting; has a larger through-way than any other trap; has no pressure inside when working; will work equally well when placed on end, side, or base; needs no attention, therefore may be fixed in inaccessible places; has no loose parts, and is light and compact. It is fully guaranteed for two years' efficient working. Special traps are made for applying to steam-heated railway carriages. The sole South African agents are Messrs. Selcraigs (Colonial), Ltd., Mackay's Buildings, Rissik Street (opposite *Rand Daily Mail* offices), Johannesburg.

A Self-Rotating Rock Drill.

A stoping drill of the self-rotating type was recently tested at the Mount Hope mine, U.S.A This drill is equipped with a rifle bar similar to that used in a position drill, and is operated by means of the usual spring and pawls. The rifle bar rotates the hammer, the front head socket, and the socket nut in which the drill is placed. The drill has the usual telescope feed. The diameter of the cylinders 2in. as against the 1¾ in. diameter of the ordinary hammer drill. The drill weighs 101lb. 22 lb. more than the usual hammer drill. The average depth drilled per day by an ordinary miner amounted to 58.85 ft.; the average actual time the drill was in operation during the 8 hr. shift was 3.7 hours, the remainder of the shift being consumed in making minor adjustments on the drill. The drilling rate per minute was 3.3 in., and the average depth of hole was 6 ft. No special effort was made toward a good showing with this drill, and it was used in ordinary mining work. A non-rotating hammer drill operated in the same ground by an equally competent drill-runner averaged 42 ft. per drill-shift. With the self-rotating drill, it was found necessary to use a 16-point bit to start the hole. followed by a six-point bit instead of the usual four-point. The difficulties experienced in using the drill were: (1) Starting the hole was difficult; (2) the drill cannot be used in loose ground, as it strikes such a heavy blow that it shatters and jars down too much of the back; (3) the drill is too heavy, as at present constructed, and one man cannot operate it on other than vertical holes. If this, or other, type of rotating drill can be perfected, it should help to counteract the dislike felt by the individual miner for the hammer drill, as the principal objection is that rotating it is very hard work.

A REVIEW OF RECENT ENGINEERING PROGRESS.

"Impressions of My American Tour"—Being the Valedictory Address of the Outgoing President of the S.A.I. of E.E.

I PROPOSE to take the opportunity which is offered me by my obligation to present a valedictory address to present to you a brief summary of what I saw and heard about in an engineering way when I was recently in the United States. Engineering developments have been numerous and startling within the last few years, and I find myself in a position of embarrassment through an excess of material to be compressed into reasonable compass. And I should add to this my apologies for not making my remarks broader in their scope lest, when I have finished, you should criticise me for having brought to your notice nothing except what is new in America. I hasten, therefore, to state that I have chosen to speak only of what I had opportunities to know about and that it is my misfortune not to have had opportunities to investigate the progress made in other parts of the world, and by other people which might well have made this address more complete and interesting. Taking first the subject nearest our hearts—mining work: It was a pleasure to find that the use of electricity in all mining operations save only one is becoming almost universal. The exception is, of course, the rock drill, for which compressed air remains practically without rival. Even in coal mining, where for generations the cost of fuel has been considered to be nil, the use of electricity is being greatly extended. Several large electric hoists are in use, notably one of 1,300 h.p. (continuous rating) by the mines of the Peabody Coal Company, and one of 1,130 h.p. (continuous rating) by the Christopher Coal Mining Company, both being Ward-Leonard-Ilgner outfits. 600 to 750 h.p. three-phase hoists with liquid control are at work at the mines of the Delaware Lachawana Coal Company, the Woodward Iron Company, the Lehigh Coal and Navigation Company, and many other mines. There are very many smaller hoists of both direct and alternating current types. The following is a very incomplete list of American mine hoists of 150 h.p. and larger which are in use:

	Number.	Total H.P.
Direct current—		
(a) Rheostat control with drum controller	7	2,825
(b) Ward-Leonard with Ilgner fly-wheel	6	3.910
Alternating current—		
(a) Drum controller	22	4,770
(b) With contactor control	22	6,750
(c) With liquid rheostat	21	8,925
	78	27.180

It is an interesting fact that of these 39. or exactly one-half, have been purchased during the last two years. A few years ago a number of the shafts of the Anaconda Copper Company were equipped with hoists operated by compressed air, the prime power being a hydro-electric installation over 100 miles away. Very elaborate reciprocating air compressors, driven by synchronous motors, air storage tanks and repeaters were installed, the purpose being to equalise the power demand and also to provide a certain amount of power storage in case of interruptions of supply. It seems now to be generally admitted that this very costly and inefficient plant was a mistake, and that the desired objects could better have been attained by a combination of fly-wheel sets and accumulators. In motor applications as well as in hoisting, American practice is following much the same lines as ours. The centrifugal pump with direct connected motor is being adopted in most cases. The subdivisions of power by small electric motors is practically universal for new reduction plants, one notable difference being the great preference shown for squirrel-cage motors. One important detail which was shown to me was a liquid hoist controller which could not be made to short-circuit even under most extreme conditions of boiling and double voltage which, at the same time, operated with saline solution such as to give a motor slip of only about 3 per cent., i.e. practically no rheostat loss at full speed. Many ingenious and successful applications of automatic or semi-automatic contactor control are in use, notably a system at the shaft of the Inspiration Consolidated Copper Mining Company, of Miami, Arizona, where two Ward-Leonard-Ilgner balanced hoists serve two closely adjacent shafts, each 630 feet deep. There is but one fly wheel motor-generator set. The duty is 1,000 tons per hour from each shaft. The motor-generator set is peculiar in that it has two 500 K.W., D.C generators coupled to a single 750 h.p. three-phase, induction motor. The large skips are automatically loaded and dumped, while the electrical automatics are such that, when the motors have been started at the beginning of a shift, no more attendance is required until it is desired to stop hoisting 14 hours later. It is important to notice that the operations in this case, being less than human, are more than human in that they never ask for more wages nor go on strike. As regards the generation of electric power, I saw or heard about much that is interesting. not so much because of novelty as of magnitude. In hydro-electric plants the largest thus far undertaken is that of the Mississipi River, near Keokuksowa, which was successfully put in operation last year This great plant has now a capacity of 150,000 h.p. and will eventually have 300,000 h.p. The units are of 10,000 h.p. each at 57·7 r.p.m., 25 cycles. The power is being transmitted principally to St. Louis at 110,000 volts. Space does not permit me to do more than mention this great undertaking. I wish also to draw attention to the fact that this work has been conceived, designed and carried out by one man, namely, Hugh L. Cooper, whose force, faith and energy, amounting to true genius, have overcome all obstacles, including those of men and finance as well as those of nature. It was my good fortune to visit the Fisk Street Station of the Commonwealth Edison Company in Chicago, just when the two world's record beating steam turbines were complete and ready for operation: indeed, both machines, one from Messrs. C. A. Parsons & Co., in England, and one from the General Electric Company in Schenectady, had already been turning over under steam a day or two before within the same hour. The ratings are 20,000 to 25.000 K.V.A. at 750 r.p.m.. and 25 cycles. In general appearance as in internal instruction the machines are very different. The Curtis is comparatively short, having, I think eight two-row Curtis stages in one casing, while the Parsons is true to its type, being without any impulse stage and having two separate

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*Read by J. W. Kirkland before the S.A.I. of E.E.

[illegible] It is, consequently, very long and of small diameter. The generators look both of about the same dimensions and both of very [illegible] strong construction. Both sets have very large surface condensers, the Parsons having turbo-type air pump, which appealed to me more than the [illegible] positive-displacement type air pump attached to the Curtis. The engineering world is, of course, all agog for news as to the comparative performance of these two leviathians. It is my very [illegible] opinion that a better result could be expected from either turbine if it resembled the other more closely. It is a fantastic thought, but it occurs to me that if these two great machines, which are housed in the same room, were by some miracle to reproduce their kind, the offspring would surpass both its parents in economy and general perfections. At a meeting of the American Institute of Electrical Engineers, I had the pleasure of listening to an original paper by Mr. W. L. R. Emmet on a new idea in thermodynamics. The paper is entitled "Power from Mercury Vapour," and describes a process for increasing the efficiency with which heat energy can be transformed into mechanical energy. The idea, which Mr. Emmet says was in part suggested to him by another prominent inventor, Chas. S. Bradley, is to, as one might say, superpose a mercury thermodynamic cycle above (i.e. in higher temperature range) a steam cycle. It is familiar to you that the highest efficiency attainable from a heat engine is capable of mathematical expression in terms of absolute temperatures $\frac{T - T1}{T}$ (Carnot cycle) when T is the highest temperature of the working fluid and T1 its lowest or discharge temperature, i.e. a temperature slightly above that of the natural temperature to which the exhaust can be cooled. In a steam cycle the top limit is fixed by limitation of pressure for which steam turbines can be built out of available materials. Now, if we take mercury vapour as our working fluid, we are able to raise our initial temperature very considerably without even exceeding atmospheric pressure, because mercury boils at sea level at 677° F. Mercury condenses in a 28in. vacuum at 457° F., so that, since for practical reasons it would be undesirable to use mercury vapour at much more than atmospheric pressure, the temperature range of the mercury cycle would be 677° to 457°. In outline, the scheme is to boil mercury in a special boiler, convert its potential energy into kinetic in suitable nozzles and abstract the same by an impulse wheel. The condenser of the mercury would be a boiler for steam since 457° F. is a convenient temperature for boiling water in a suitable device to such temperature and pressure as are usual in steam power stations. I may add that Mr. Emmet's principal idea at present is that this invention will be made applicable to improving the economy of existing steam stations and that the steam produced in the mercury condenser-boiler would be mingled with that produced by the ordinary coal-fired steam boilers. All things considered, Mr. Emmet estimates that about 14 per cent. more energy per pound of coal could be obtained with the new system as compared with straight steam. The idea is certainly ingenious, but there are, of course, many practical difficulties to be overcome by invention before the process can be anything more than a "likely prospect." In steam turbine construction the universal tendency is towards higher rotative speeds, for example, 3,000 r.p.m. is rapidly becoming the normal speed of turbines of even relatively large capacity, that is to say of 3,000 k.w. to 4,[illegible] k.w. I saw work in progress on some 60 cycle turbo-alternators of 35,000 k.w. capacity. Of course all of these large high speed machines are of the horizontal type, as vertical construction does not lend itself to high speeds and extra large outputs. The maximum transmission voltage in practical use to-day is 150,000 volts, and, as far as one can see, this is as high as will ever be adopted. The present day tendency of transformer construction appears to be to design with comparatively high internal reactance in order to minimise the destructive effects of short circuits. Transformers of 15,000 k.v.a. capacity are, up to the present, the largest that have been built. While such very large transformers have necessarily to be water-cooled, much progress has been made in the design of self-cooling transformers. In the electric lighting field the most interesting new development is the nitrogen-filled tungsten lamp, which can be burned at an efficiency of one-half watt per candle power. This lamp is the result of very minute and protracted investigation of the cause of blackening in tungsten lamps. It was found that blackening is due to one or two causes, either the presence of vapour in the exhausted bulb, or the evaporation of the filament when run at very high temperature. It is obvious that blackening due to the evaporation of the filament cannot be prevented, but by filling the lamp with an inert gas like nitrogen, it is possible to divert the blackening to a part of the lamp globe where it will do no harm. The nitrogen, which is put in at about atmospheric pressure, serves this purpose. Convection of currents takes place in the gas in such a way as to carry the evaporated tungsten up into the long neck of the lamp, where it is deposited. Owing to the wastage of tungsten when operated at very high temperature, these ½ watt lamps can only be made with very thick filaments. Five amperes is at present the lowest current for which such lamps are made, and it is obvious that to get small candle powers it is necessary to make the lamps for low voltage. For burning directly on a 110 volt circuit, one cannot secure lamps of less than about 500 watts; that is to say, 1,000 candle power, while for burning on 220 volts and thereabouts, the smallest practical wattage is about 1,000, corresponding to 2,000 candle power. The life of these lamps is about 1,000 hours. The quality of the light is very superior, closely approaching that of sunlight. The electrical propulsion of ships is becoming a matter of considerable engineering interest, and it appears not at all improbable that the next few years will see a great many ocean-going steamers propelled by electric motors which receive their power from high speed turbo-generators. The United States steam collier "Jupiter" is so equipped. She is a ship of 20,000 tons, and has two driving motors which operate at 110 revolutions. The turbine is of about 7,000 h.p., and runs at 2,000 revolutions. The speed of the ship is about 15 knots.

Finance, Commerce, and Industries.

The Rating of Site Values.

The Draft Ordinance to be introduced into the Transvaal Provincial Council to amend the Local Authorities Rating Ordinance, 1912, is published in the "Provincial Gazette" for general information. The Ordinance provides for the taxation of the unimproved value of land by local authorities, and the taxation of the value of improvements, if on account of the provisions of the Gold Law, or any other reason, the unimproved value of land cannot be assessed for rating purposes. Under the Ordinance all rates shall be levied upon site values, unless the local authority, by a resolution of a majority of its members, decides to levy a rate upon the whole or any portion of the value of improvements.

* * * *

Ranching in the Transvaal.

In his annual report to the Transvaal Consolidated Land and Exploration Company, Captain Madge makes interesting reference to the possibilities of ranching in the Northern Transvaal, and of agriculture in South Africa generally. "In previous reports," he says, "I have laid stress on the fact that the northern districts of the Transvaal warrant far greater attention from the Government and the general public than they have so far received. These districts are capable of profitably supporting a large European population, but they require greatly increased means of communication, together with a practical demonstration on a far larger scale than has been attempted in the past of their possibilities. The possibilities of great areas of outlying land in the northern districts of the Transvaal for profitable cattle ranching are no less promising than the possibilities of those parts of Rhodesia where capital is now being freely invested for this purpose by world-known firms, and land at present can be obtained in these districts of the Transvaal equally if not more accessible and suitable, and on as favourable terms. Cattle ranching on an extensive scale in the more outlying districts of the Transvaal will without doubt be the next important step in their development, and it will be materially assisted by the experience and knowledge gained through cattle ranching on a small scale, which has already been profitably established." Later he remarks: "South Africa is commencing to give practical proof of the great potentialities of her land, and it cannot be long before these potentialities are widely recognised by men with capital and experience at present in other countries. I am confident that an era of agricultural and pastoral development entirely overshadowing what already has been achieved awaits South Africa, and that its effects will reach with permanent results every portion of the sub-Continent inhabitable by Europeans.

* * * *

The report of the British South African Explosives Company, Ltd., for the year ended 3 st October, 1913, states that the balance sheet shows a net profit of £63,211, after deduction of £1,250 for directors' fees, of £27,441 for factory depreciation, of £2,500 written off investments, and of £2,500 added to the explosion, insurance and workmen's compensation fund. The profit includes £22,970 on interest standing to the credit of profit and loss account is £90,179, of which the directors recommend that £19,500 be applied in payment of a dividend of 7½ per cent., free of income tax, leaving £40,679 to be carried forward. The high price of glycerine caused a large reduction of profits on the explosives business in comparison with the previous year, but to the extent of about £8,100 this reduction has been counterbalanced by an increase in the net yield from investments, which now include a large holding of 7 per cent. cumulative preference shares of Canadian Explosives, Ltd. The quantity of explosives sold was somewhat larger than in the previous year.

SPECIAL AGRICULTURAL MACHINERY
AND
AUTOMOBILE SUPPLEMENT.

AGRICULTURAL MACHINERY AT THE RAND SHOW.—I.

Brief Review of Engineering and Automobile Exhibits—Improvement on Former Years—Some Notable Features.

The outstanding features of the great Rand Show this week were the Machinery and Automobile Sections. Both achieved records in size and completeness. Both attracted a greater amount of attention than ever before, and reflected commendable enterprise on the part of the exhibitors. In the Machinery Section particularly, everything that the modern, scientific farmer could possibly require was on view. Gas and oil engines, steam engines, windmills, and every conceivable power and labour-saving device was illustrated or represented. This side of the Show possessed an instructive value of its own; and provided object lessons of no little interest and novelty to an unfailing procession of visitors. Special mention may be made of the display of the British Westinghouse Co., Ltd., which stood out even in the midst of so much that was excellent. The exhibit may be said to have represented the last word in modern engineering science applied to power plants for agriculture. It is impossible, however, this week to do justice to all the novelties shown. It is enough to state that the collection of machinery, British, American and German, must have proved a liberal education to our farmer visitors in the use and promise of modern agricultural engineering devices.

The Automobile Section.

Never before at a Rand Agricultural Show has the Automobile Section bulked so large or made so good a general appearance. All the latest models of the most modern cars were represented; and the whole proved a veritable eye-opener in the extent to which smartness, efficiency and finish are combined in this year's models. Accessories were, of course, well in evidence; and the thousand and one subsidiaries of the motor car trade were well illustrated. Among the exhibits of the tyres of to-day, the Continental held pride of place, and a more detailed description of this well-known firm's exhibit follows. The Vacuum Oil Company was well to the fore with its well-known products, without which, of course, no modern motor show would be complete. Next week we hope to describe more fully the exhibits put up by this and other prominent firms.

The Scene of the Great Rand Show: The Showground, Johannesburg.

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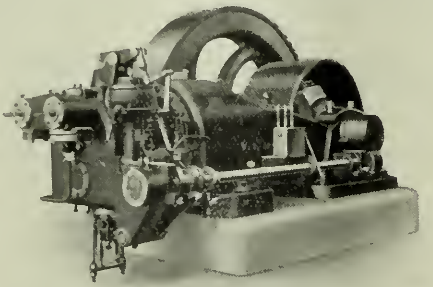
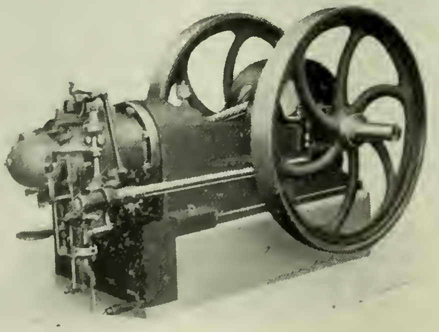


Westinghouse Oil Engines are particularly suited for irrigation and farm work, requiring no attention after starting-up and being fitted with oil feed pump of special construction and fuel atomizer, ensuring complete combustion of fuel and high economy.



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IRRIGATION IN SOUTH AFRICA.

A Growing Market for Pumps, Oil Engines, Suction Gas Plants, Piping, etc,

South Africa's great need, of course, is a more truly national and comprehensive irrigation policy. The importance of what is actually being accomplished under Government encouragement and with a considerable measure of official assistance, must not, however, be overlooked. True, the achievements to date are in the nature of a patchwork, dependent on purely local enterprise or lack of it, but the linking up of the patches must be a question of large policy, which can only be left to statesmen, and meanwhile it is well, from a commercial point of view, to accept conditions as they stand, and to make the most of the business actually offering. Some idea of the character and value of that business may be gathered from such facts as that under the system of irrigation boards, no fewer than 30 districts have been proclaimed in the Cape Province alone, the capital expenditure involved being as much as £850,000; a number of Government irrigation settlements exist in the Cape, Transvaal and Orange Free State Provinces, and numerous new and important projects are now under investigation; some 28 large drills are being used in water-boring operations on Crown Lands, and boring is proceeding on nearly 400 farms, and according to the recent statement of the Union Minister of Lands, during the twelve months ended 31st March, 1913, when the number of drills at work was much smaller than at present, 93 holes were completed, having a total footage of 18,440, and a yield of 1,321,500 gallons per day.

Types of Pumps in Demand.

These facts are strikingly suggestive, and could be largely supplemented if space allowed, but, having demonstrated the importance of the field, our object is solely to indicate the commercial openings involved. It the first place, the amount of boring going on is very noteworthy, for a gravity scheme obviously makes no call on the importer of machinery and material, as compared with a system dependent on water obtained from wells, or by pumping from a low level to a high level. The pumps in most general use in South Africa are a reciprocating type, the adaptability of which to varying capacities and heights largely accounts for its popularity. It is specially suitable for installation where the water supply is irregular, demanding no more power than is justified by the work it is called upon to perform. For handling dirty water, however, the centrifugal pump is more satisfactory, owing to its lack of valves; in addition to which its first cost is less, though its effectual capacity is confined within certain height limits—say 50 feet— and it is most suitable for dealing with a regular supply.

Vogue of the Suction Gas Plant.

In regard to motive power, fuel supply naturally governs the choice of plant in most localities throughout such a country as South Africa. For small pumping installations oil engines up to 6 h.p. are very commonly used, and with increasing success now that owners of irrigated farms are less prone than formerly to imagine that the simplicity of working these motors extends to leaving them to run themselves without supervision and without an occasional over-hauling and turning up. For larger installations suction gas plants are extensively employed, one of the most important to date being a 108 b.h.p. equipment at Grahamstown, while others at Oudtshoorn and elsewhere are of nearly that capacity. In some districts anthracite coal is available and cheap to use, but suction gas plants designed for wood fuel or charcoal are more widely in demand. In fact, the suction gas plant is already, and is certain to become more so, the accepted type for irrigation works of any size, and this in spite of the fact that it is easy to find mechanics and drivers possessing an expert acquaintance with steam engines, but with everything to learn about gas engines. Needless to add, the success of any type of engine or pump in this market is mainly dependent upon the business acumen, combined with a modicum of technical knowledge, displayed by the importer holding the local agency for it. Many farmers who undertake the irrigation of their own properties rely for expert advice on the local machinery merchant, and the influence which the latter is thus enabled to wield in making sales for a particular type of plant is only equalled by the responsibility thus thrust upon him. That South African importers have on the whole proved themselves equal to their opportunities in this respect is shown by the rapid and substantial success of the irrigation movement among farmers in every part of the Union, and this may be said even after making full allowance for the splendid work accomplished by the experts of the admirably organised Government Irrigation Department. Within the last few years—certainly since the passing of the Cape Act in 1906—irrigation has come to be recognised as essential to successful farming in the Union, and, thanks to the agricultural prosperity which has rendered capital available, has advanced by leaps and bounds, so that South Africa to-day ranks as one of the most valuable and progressive markets for suitable engines, pumps, piping, etc., in the world.

INCREASING USE OF OIL ENGINES IN SOUTH AFRICA.

Utility of Oil Engines on the Farm.

The position in South Africa of the oil engine in relation to the country's industries is a peculiarly interesting one; yet the fact is not so fully realised as it might be either by Colonial importers and industrialists or home manufacturers. This, of course, more particularly applies to small types up to four or five horse-power capacity, for the installation of larger engines is usually undertaken on the advice of responsible engineers, as in the case of mines or extensive factories and workshops, and the result is that high-grade makes are almost invariably selected. The smaller engines are required more generally by users who lack expert knowledge, such as farmers and minor industrialists, and who are easily influenced by considerations of price, etc. Even these, however, learn by experience, and it is the growth of knowledge among such that is responsible for a complete change in the market as compared with a few years ago when a certain type of small and cheap American oil engine was the vogue. The latter has lost ground in a marked degree owing to its frequent development of defects and shortness of life, while British makes, even though dearer, are increasingly valued for their good workmanship and reliability. Indeed, at the present time probably seven or eight out of every ten oil engines in use in South Africa are of British make.

Features of Small Engines.

Even so, however, there is plenty of scope for further progress, equally in the education of users as to the varied possibilities of this form of prime mover, and in the value of good workmanship. Too many engines, mainly of cheap foreign make, are still to be found in South Africa with badly-cut gearing and beams that fracture under extra strain. What is most generally wanted is a motor driven by paraffin or crude oil, and capable of quick and easy transitions from belt-driving farm machinery, such as mealie crushers, chaff cutters, or centrifugal pumps, to direct coupling with pump rods, etc. Essential features are simplicity, strength, standardised and interchangeable spare parts, and adaptability to portable or stationary work, and to the driving of anything from farm and irrigation plant to milling machinery, printing presses, machine tools and circular saws. The market is an active one for any small oil engine possessing these points, while the maker who introduces a satisfactory air-cooled engine is assured of a big success.

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Vacuum Oil Company of South Africa, Ltd.

THE MOTOR FUEL QUESTION IN SOUTH AFRICA.

Mineral or Vegetable Fuel?—A Consideration of the Claims of Alcohol, Benzole and Other Proposed Distillates—The Position in the Union.

Recent investigations have made it clear that old conceptions regarding yields of liquid fuel from the various mineral resources must be considerably revised. Improved and properly-controlled systems of destructive distillation, new methods of effecting the process known as "cracking" cheap hydro-carbon oils (including creosote), and the recovery of by-products which have hitherto been wasted, instead of conserved, are generic examples of the underlying causes which render such a revision essential to a true understanding of the present situation in relation to modern road transport.

Multiplying Processes.

It was commonly accepted, only a year ago, that a high estimate for British-produced fuels was a maximum yield of 10 million gallons per annum. How different is the prospect now. There is absolute knowledge of available benzole supplies from recovery ovens in excess of 15 million gallons per annum, with early prospects of this total reaching double that quantity; if occasion arose, and if orders were given for ordinary town gas to be stripped of its benzole, at least another 40 million gallons per annum can be rendered available forthwith; by "cracking" creosote oil, which raw material is obtainable within the country, a further 50 million gallons per annum of motor spirit is practically assured to us, subject to a reasonable interval of time for the establishment of the requisite plant at a number of centres, or at individual coal-tar-distilling works. Beyond the foregoing, and well within sight of production, we have the yield of suitable motor spirit from a large number of shales and shale-like deposits, in which category we class so-called cannel coal. Much may be expected from the last-named branch, whilst peat promises to come within practical and commercial range, now that the problem of excluding the water by mechanical pressure has been solved by the Frankett process. Finally, compressed coal-gas can be utilized in special cases of road service; it has already replaced petrol for much bench-testing.

British Production 70,000,000 Gallons a Year by the End of 1915.

We are not laying ourselves open to any charge of optimism, when we state that by the end of the year 1915 at the latest the available total of British-produced motor spirits, of a character which is suitable for use, in existing engines, will certainly be not less than at the rate of 70 million gallons per annum, from exclusively British sources as regards the raw material, and without reckoning the potential yield, which may be turned to account at any time of emergency, by stripping down town gas of its benzole.

The variety of the foregoing sources of supply of mineral fuel is obvious; their exhaustion, on any accepted statistical basis of computation, will certainly not concern our generation, nor the next. It may become of moment next century, and we will grant that posterity has a claim upon us not to ignore them. Allowance, too, must be made for improvements in the processes that are involved, and they will defer the evil day of any re-assertion of the present temporary case, in which we find ourselves unpleasantly placed, of real dependence upon imported fuel.

Alcohol Manufacture Needs Vitriol, Coal and Lime.

The claims of vegetable fuel are based upon the theories of unlimited supply and distribution in the world. By cultivation, subject to the limits of the soil of any particular country, it should be possible to make alcohol anywhere and everywhere. We agree, if the Polar regions and the deserts be excepted. The product would be one and the same chemical substance, and the new fuel would be suitable for the new types of engines which we are told will be constructed hereafter in large numbers to enable alcohol to be used. Readers will do well to remember that alcohol cannot be used with advantage or safety in an ordinary petrol engine, whilst any of the mineral fuels to which we have referred can be so used.

Appreciation of the diverse sources of alcohol is probably not so widespread as it might be. Alcohol can be made by fermentation from any sugar; the sugars in their turn, other than cane sugar, can be made by treating starch or cellulose with sulphuric acid. All cereals and roots contain starch, and all plants and woods contain cellulose. Roots of the sugar class call only for fermentation with yeast. The cycle of production from cereals and potatoes is simple—provided the vitriol can be taken to the fields or the forests—but coal and lime are required.

The Case of South Africa.

Some countries, of which South Africa is one, are crying out for alcohol as a fuel, and for the right classes of engines in which to burn the alcohol when it is available for that purpose. Animal transport, here and elsewhere, is impeded or impossible. There may be an absence of Excise regulations in the Union of South Africa, but the ample supply of cereals or timber may not compensate for the lack of cheap supplies of the other essential—the vitriol. We should think that it is probably fully as difficult to transport carboys of vitriol as it is drums of petrol, but we may be wrong. We doubt the saving in fuel cost, when alcohol for power runs free and unrestricted—if that day come. It is not a practicable scheme to lay down vitriol chambers at many centres in a country like South Africa, because pyrites, the chief raw material for the production of that acid, is principally found in Spain, whilst other factors, as in the United Kingdom and the United States of America, will dictate the establishment of the necessary vitriol-producing industry in certain places only. The idea that alcohol can be cheaply and widely produced in South Africa has yet to be proved sound in practice, and we should be sorry to specify alcohol-type engines yet awhile. On the other hand, we admire the enterprise and confidence of the few British makers who have decided to get ready for a possible new demand by initiating new engine designs.

More Likely 2s. a Gallon than 1s.

The broad question of price will ultimately settle the claims of alcohol, and we believe they will be settled adversely. It has never yet been demonstrated in any part of the world that alcohol can be commercially produced so that it can be sold at 1s. per gallon. We should put the figure at an average of nearer 2s. per gallon, and at the latter figure its chances of competing successfully, other than in exceptional instances which may or may not count in the aggregate, are hopeless, in comparison with the known range and extent of present and visible supplies of motor spirit from mineral sources. We give our vote unhesitatingly for the claims of the mineral kingdom in this fuel problem, for years to come.

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THE QUESTION OF TYRES IN SOUTH AFRICA.

Large Size Tyres—Why Their Use Should be Advocated—Oversize Tyres as Standard.

It is nothing less than astonishing that, generally speaking, motor car owners take so little care of the tyres fitted to their cars, and this appears the more extraordinary when it is remembered that, in this country at any rate, tyres are comparatively the most expensive "accessories" fitted to a car, and anyway form the chief item in the upkeep charges. In this connection it is exceedingly instructive to notice that tyres fitted to taxicabs have a much longer life than those tyres of similar type and size when used on private cars, and this is mainly due to the fact that although such tyres have to endure rougher use on the road yet they are so systematically looked after in the garage. They are always kept pumped up to the correct pressure, and all those little cuts which appear so insignificant, but which if neglected lead to bursts, if not more serious things, are attended to before any deleterious effect has been allowed to develop. If the average motorist only realised what economies could be effected by giving a little more care and attention to the tyres of his vehicle, there would be far less grumbling on that score, and stories as to the longevity of tyres would form a welcome alternative in the smoking room to golfing and fishing exploits. It may come as a surprise to some owners to know that, excluding accidents, of course, there is no reason why the casing of a good tyre should not last out three or even four treads, as is quite a usual occurrence in connection with taxicab tyres, which tyres, it may be pointed out, are of exactly the same quality as those used by private motorists. It should, however, be borne in mind that tyre repairing is not a thing to be lightly entered upon, and should, in fact, only be entrusted to those who have the proper facilities. Although it is possible to deal with small repairs with the portable vulcanisers now to be found in every well-equipped garage, work of a more extensive nature, such as retreading or the repair of bursts or large cuts, should be sent to those who specialise in such work.

Continental Tyres.

Special importance attaches to the Continental exhibit in the Automobile Section of the Rand Agricultural Show this year, on account of the original introduction by this firm of "oversize" tyres. For some time past motorists have realised that a good proportion of their troubles have been due to their cars being under-tyred, but it has been left for the Continental Company to interpret their ideas by boldly coming into the market with tyres suitable for fitting to existing rims, but of greater dimensions than those usually supplied. Although this results in an increased initial cost for tyres, it is not saying too much to asseverate that the saving in the long run will be considerable, and the firm are deserving of the thanks of all car users for putting in their way one means of overcoming the bugbear of continued troubles. These oversize tyres are constructed on the same lines as the usual sizes, the only difference being the increased dimensions, and, of course, corresponding increases in strength of casing, thickness of tread, etc. All Continental oversize tyres are made in the firm's usual patterns, viz., flat and ribbed tread and steel-armoured non-skid, and their imposing size, strength, larger tread, and increased air capacity should ensure an exceptional degree of resiliency and durability. Coming to the other extreme, there is shown an 80 mm. tyre for light car use, and this shows the same care in construction and excellence of materials as

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was difficult if not impossible to obtain before the introduction of

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Economy { "Oversize" Tyres are heavier and stronger, and give much greater mileages than the ordinary tyre. They fit your present rims; no alteration is needed.

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characterise the other Continental productions. It is impossible to enumerate all the many items that make up this firm's exhibit, but suffice it to say that the display includes a full range of tyre sundries and useful rubber goods. Altogether the Continental Company have a decidedly attractive proposition to put before agents, who, we imagine, will not be slow to share in the increased prosperity the latest programme foreshadows. More than usual interest attaches to the specimens of solid rubber tyres that will be found on the Continental Company's stand, by reason of the fact that the Municipalities of Benoni, Boksburg, Bloemfontein and Germiston have ordered all the trackless trams to be equipped with Continental solid rubber tyres. Continental tyres are esteemed amongst motor-cyclists, and the latest patterns to be displayed will reveal an increase in strength without affecting resiliency. A really thick rubber tread is provided, which is built upon four plies of tough fabric, being further reinforced by another three plies midway between the casing proper and the tread. This company will have an attractive group of cycle-car and side-car tyres on view, whilst the Continental inner tubes, both of the ordinary and butt-ended varieties should not be missed. The new pattern butt-ender is a notable production, both ends having been formed of stouter rubber, a shoulder being provided in the entering end which renders it almost impossible for the tube to pull apart after insertion. A complete range of cover sections will be staged, so that constructional details can be freely examined.

"Oversize" Tyres.

There is much to be said for the adoption of a higher scale of tyre capacity than has, with one exception, been generally considered necessary by tyre manufacturers, in view of the greater economy results from the employment of tyres of large size. Tyre manufacturers themselves have, we think, always held something of the same kind of views, but individually they have hesitated to press their advocacy because of the increased first cost to the user and the difficulty that has existed of bringing the average man to understand that the manufacturer is not advising the use of the larger tyres solely from motives of self-interest. But the position is altering and the motoring public coming round to a better understanding of the capabilities of tyres, mainly by observing the improved behaviour of large size tyres on the cars of their friends. We should be glad to see, on the part of the whole of the tyre manufacturers, a complete revision of their scales of permissible weights carried by tyres and a greater willingness to supply two sizes of tyres for each of the most popular sizes or rim. The improvement in tyre manufacture in recent years has largely overcome one of the difficulties—that of obtaining tyre casings of sufficient strength—and for our part we can see no objections but only advantages to be derived from advocating the use of large size tyres, for to employ them means longer tyre life, lower internal pressures, and fewer road troubles. In fact, we contend that oversize tyres should be standard and undersize tyres non-standard, thus reversing the present rule. The use of Continentals, the original oversize tyre, is therefore to be recommended.

Lonely Reef G.M. Co.

The following are the particulars of output of gold from the Lonely mine for the month of March, 1914:—Mill ran 23·16 days; crushed 5,530 tons; yield of fine gold, 1,288·313 ozs., value £5,416 2s. 1d.; slimes treated, 5,530 tons; yield of fine gold, 2,893·665 ozs., value £12,166 1s. 1d.; total recovery of fine gold, 4,181·978 ozs.; total value, £17,682 3s. 2d.; estimated profit, £9,082.

Morgenzon.

The concession held by the T.G.M.E. on the farm Morgenzon lapsed on May 13th last year. At the same time there appeared in the *Government Gazette* a notice proclaiming the farm a public digging; with an addendum that the public would be notified later when the ground would be open for pegging. Nearly twelve months have elapsed, and nothing has been done, says the Pilgrims Rest paper. Are the Government not going to take steps to throw the ground open for pegging, or are they, as has been hinted, submitting the whole farm, or sections thereof, as a going concern to the highest bidder?

Harmony Proprietary.

The Secretary of the Harmony Proprietary Company has issued the following circular to shareholders:—"I am instructed to inform you that a meeting of shareholders will be called at an early date to submit and pass the accounts and *inter alia* to consider a proposal for putting the company into possession of ample funds without a compulsory assessment, so as to enable your directors to energetically turn to account the various valuable assets comprised within the company's vast freehold estate. The proposal under consideration for raising the necessary working capital is the issue of 200,000 £1 cumulative preference shares to carry interest of 10 per cent. per annum until all interest and principal be repaid, after which they shall in all respects rank equally with and be entitled to the same rights as the holders of the existing ordinary shares. After the meeting the privilege to take half of these shares will, in the first instance, be offered to the shareholders. The balance of 100,000 are reserved for South Africa. The railway to the company's property has recently been completed and passes through one of its farms and adjacent to the whole of the eastern boundary. The advent of the railway, together with the provision of working capital, will enable your directors to turn the company into a sound and profitable undertaking. The advices received from the Transvaal indicate that several substantial persons and firms in that Colony are anxious to negotiate working arrangements in connection with the mineral and farming possibilities in our area. The vacancy on the board of directors caused by the death of Mr. J. Barr Robertson has been filled by the election of a gentleman with considerable knowledge and experience of Transvaal affairs, which will undoubtedly be very beneficial to the future of this company. The board propose to ask you to confirm this election at the meeting to be called shortly, of which due notice will be forwarded."

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72. F. G. B. Marshall.—Marshall's improved binder.
73. Arthar George Robinson.—An improvement in the manufacture of fire buckets.
74. Thomas Lean.—A combined trap nest, sitting and brooding appliance.
75. Samuel Harris.—Jambing bags for machine and hammer holes.
76. Louis William Greve.—Improvements in rock drills.
77. John Hutt.—An improvement in the attachment of handles to brooms and in similar attachments.
78. Simen Adde.—Improvements in explosives.
79. Edward Brice Killen.—Improvements in and relating to rubber tyres and their attachment and detachment to and from wheels.
80. Guy Aubrey Chalkley.—Improvements in connection with rotation mechanism for rock drills.
81. George Frederich Taylor.—Improvements in washing and gravitating machines for the recovery of diamonds.
82. Sidney Herbert Pearce.—A method of coagulating the surface of sand dumps.
83. William James Barnett.—Improvements in water connections for rock drills.
84. Wilhelm Mauss.—Improvements in speed-gearing.
85. William Henry Aghan.—Improved process and means for separating precious metals from their ores.
86. Andreas Smorenburg, and Peter August Smorenburg.—Improvements in privies.
87. William Edgar Muntz.—Improvements in the treatment of vulcanised India rubber goods embodying a foundation fabric.
88. Richard Thomas Whitford, and Charles Morris.—Window blind brackets.
89. Robert Hurne Gould.—Improvements in or appertaining to electrical lighting power installations and plants.
90. Sidney Harold Hills.—Continuous water feed for hollow rock drills and the like.
91. Daniel Corbett.—A machine for bending springs.
92. James Howard Vivian.—Improvements in drill sharpening machines.
93. Richard Pearce Rosewarne.—Improvements in crucible furnaces.
94. Ferdinand Heck, and Mannesmannrehren Werke.—Improvements in or relating to pipe joints.
95. Carl Henry Peck.—Improvements in valves for percussive tools.
96. Clarence Henry Hapgood.—Improvements in scales.
97. James Miners Holman, and John Leonard Holman.—Improvements in apparatus for passing liquid into hollow rock drills.
98. Henry Williams Rogers.—Improvements on safety catch for cages, skips and lifts.
99. Charles Gustav Reich.—Electro magnetic apparatus for use in acrobatic and other performances.
100. John William Birtley Craggs.—Improvements in jockeys or rope grips for mechanical haulages and the like.
101. Allan Macgregor Ritchie.—A safety guard for windows.
102. Charles Cromwell.—Improved means for reinforcing the standards of wire fences and for retaining the wires therein.
103. Charles Cromwell.—Improvements in and relating to straining posts for wire fences.
104. Harry Moss Ashton.—Improved instrument for removing the hides or skins from carcases of cattle, sheep and other animals.
105. Thomas Stothert McLaren.—Electro thermo carpet or rug.
106. Ludwig Owen Meuck and William James Ballantyne.—Improved apparatus for drawing off aerated waters and the like.
107. Morris Samuel Sachs.—Improved safety catch for skips, lifts and the like.
108. Jack Yates and Charles Heyes.—Improvements in safety devices or arrestors for colliery winding cages, hoists and the like.
109. Gogu Constantinesco and Walter Haddon.—Improvements in and relating to hydraulic power transmission.
110. Lewis Caesar van Riper.—Cinematographic apparatus.

S.A. Gold Mines.

The directors' eleventh annual report for the year ended 31st December, 1913, shows that the balance of the five per cent. first mortgage debenture issue standing at £77,000 at 31st December, 1912, has been reduced by the purchase of £15,000 worth of debentures; the debenture bonds in circulation at 31st December, 1913, therefore amounted to £62,000. The balance to credit of profit and loss account at at 31st December, 1913, was £37,386 17s. 6d., from which was deducted the following amounts:—Claims and mining ventures written off, £24,494 7s. 1d.; depreciation written off shares, £12,832 10s. 9d.; leaving a credit balance carried to balance sheet of £59 19s. 8d.

Namaqua Copper.

The available profit for 1913 of the Namaqua Copper Co., including £7,515 brought forward from 1912, amounts to £48,056. An interim dividend of 10 per cent. (or 4s. per share) was paid on November 18 last, and the Board now recommend the payment of a final dividend for the year 1913 of 12½ per cent. (or 5s. per share), making a total dividend of 22½ (or 9s. per share). A balance of £5,607 will then remain to be carried forward. Considerable development work has been carried out during the past year in conjunction with the ordinary mining, with the result that the output and the reserves have been maintained at about the same figures as at the end of the previous year, there being a slight increase in the quantity of ore in sight, and a very small reduction in copper. The smelting furnaces have worked regularly, and the new concentration plant is now profitably treating the low grade ores that have hitherto been set aside. Briquetting the fines from the ore, and the old dumps, has been successfully carried on, and as a consequence it will be observed that an appreciably less quantity of ore has had to be taken from the mines.

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→ 3 ←
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TRANSVAAL
WORTH REMEMBERING.

1. The **TRANSVAAL** is producing over one third of the World's Gold Output.
2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant.
3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Manager's Association.**

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CONTENTS. PAGE

Notes and News ... 211

Topics of the Week:

Transvaal Landowners' Activities ... 213
The Year with Rand Trade and Commerce ... 214
The Rand's Ore Reserves ... 215
Security of the Rand's Underground Workings ... 217
Mining Men and Matters ... 217
Mine Models and Their Uses ... 218
Manager and Staff of the Knights Deep, Ltd. ... 219
Concentration of Diamondiferous Ground as Applied at De Beers—I. ... 220
Relation of Geology to Mining—I. ... 221
An Analysis of the Rand's Outstanding Features in 1913 ... 221
Correspondence and Discussion: "How to Exploit the Outside Districts"; "Another Prospector's Views"; "The Shortcomings of the Prospector"; "What is Wrong with South African Mining?" ... 223

Rhodesian Section:

Latest Mining News ... 225
Engineering Notes and News ... 227
Electrical Power and Light on S.A. Farms ... 229
Electric Traction in Mines ... 231
Finance, Commerce and Industries ... 232
The Year with the Johannesburg Distribution Trade 234
The Week in the Sharemarket ... 235
South African Railway Tours ... 236
Automobile Notes ... 237
South African Motor Legislation ... 237

Notes and News.

Result of Voorspoed Commission's Enquiry.

Though nothing is yet officially known, it is understood that the Commission appointed by the Government to enquire into the possibility of the Voorspoed Mine being worked at a profit has decided in favour of De Beers. The latter, being the owners, contended, it will be remembered, that under the conditions prevailing in the diamond market, the mine could now only be operated at a loss. Expert evidence in support of this view was led before the Commission that recently sat, and it was clear that the overwhelming weight of evidence lay on the side of De Beers. Mr. P. Ross Frames, it will be recalled, represented De Beers on the Commission. The decision means that the mine will remain closed down until such time as the market for diamonds improves sufficiently to warrant its working at a reasonable profit. It is to be hoped that the decision will have the further good effect of bringing home to the general public the fact—which ought to be self-evident—that the best judges of the profitable possibilities of a mine are the owners, or, as our Socialistic friends love to call them, "the profiteers," whose business it is to seek opportunities for the employment of capital.

* * * *

The Rand's Ore Reserves.

Elsewhere in this issue will be found our usual annual table of the ore reserves of Witwatersrand mines. The figures given this week reflect the position as at December 31st last, or at the conclusion of the financial years of the companies in question. It will be observed that a grand total of about 115,000,000 tons of ore, capable of being worked at a profit, is arrived at. Furthermore, the aggregate value of gold contained in this tonnage is estimated to amount to £155,000,000. We need not dwell on the importance of these figures. Ore reserves represent the life blood of the Rand mining industry or the stock-in-trade on which the prosperity of South Africa largely depends. We recommend some study of the statistics given this week to investors and statesmen, and in fact to all directly or indirectly concerned with the great industry of the Main Reef series.

* * * *

A Plethora of Accidents.

During the past week a distressing number of accidents has occurred along the Witwatersrand; indeed there has been a most unfortunate plethora of catastrophes, which have in one or two instances been attended by loss of life. From Randfontein to Benoni underground misfortunes have been painfully plentiful during the past few days, and it would seem as if these occurrences, like many other things, come to pass in periodical cycles. Happily the loss to life and limb has been nothing great, but that should not deter managers as well as men from doing everything possible to minimise chances of further accidents in the future. It is noteworthy that the majority of the catastrophes appear to have been concerned with explosives.

* * * *

Luipaardsvlei Estate Co.'s New Plant.

Operations of the Luipaardsvlei Estate and Gold Mining Company should show some signs of improvement in the course of the next two or three months, as the two new standard tube mills, of which erection was agreed upon by the Board some little time ago, are expected to commence working within the next few weeks. It it interesting to note that at the present time this is the only gold mine between the townships of Roodepoort and Krugersdorp that is operating on anything approaching a large scale, the other important propositions of this, the poorest section of the Witwatersrand having been idle for some considerable time past. The Luipaardsvlei has been a consistent earner of moderate profits, and with the starting up of the two new tube mills some improvement in these returns is doubtless to be expected.

The Pneumonia Scourge.

It is announced that the Rockefeller Institute for Medical Research, New York, has agreed to send a mission of bacteriological experts to conduct studies in pneumonia on the Rand under the auspices of the South African Institute for Medical Research. It has been planned that this mission should arrive in Johannesburg about the 1st of August next. The object of this visit is to offer service as experimental investigators into many of the unsolved problems regarding the nature, cure and prevention of pneumonia.

* * * *

The Forthcoming Mining Exhibition.

Success is already assured for the forthcoming Mining Exhibition, to be held from May 19th to 29th under the auspices of the Chemical, Metallurgical and Mining Society. In addition to the prizes to be given for "Safety First" devices by the Prevention of Accidents Committee of the Rand Mutual Assurance, the South African Red Cross Society has offered a prize of £5 and a bronze medal for the best exhibit of a stretcher for underground use in mines, £5 and a bronze medal for the best exhibit of an ambulance appliance (other than stretchers), and a bronze medal for the best exhibit of a first aid box for use in mines. During the exhibition a series of popular lectures will be given. Mr. Archibeld, Deputy Inspector of Mines, Krugersdorp, will take as his subject "Safety Measures in Mining"; Mr. C. B. Saner will deal with "Safety Measures in Shaft Sinking"; Dr. L. G. Irvine will discuss "Rescue Appliances"; Mr. F. W. Girdler Brown will speak on "Electric Blasting"; Mr. W. Cullen will deal with "Safety Measures in the Use of Explosives." A special supplement will be issued by this paper dealing with the chief features of the exhibition and describing the history and progress of the "Safety First" movement on the Rand.

* * * *

Sakalavas.

Mr. E. E. Holman has, on behalf of the Natal shareholders of the Sakalava Company, arranged with Mr. L. A. Stewart, the Chairman of the Sakalava Madagascar Proprietary Oil Fields, Ltd., to visit Pietermaritzburg this week for the purpose of delivering an address to the shareholders and their friends on the prospects of the company, the proceedings of the annual meeting recently in Johannesburg, and to discuss the advisability of floating a subsidiary company.

* * * *

Labour on the Mines.

Labour statistics of the mines in the Germiston area published this week show that at the end of 1912 the numbers employed were 2,434 whites, and 29,865 natives. These figures steadily advanced during the first half of last year; then came the July strike, and the ebb tide set in so strongly that by the end of 1913 the figures were reduced to 2,011 whites and 21,363 natives—diminutions of 423 and 8,502 respectively. During last year the ratio of whites to natives improved from one white employee to every 12·2 natives, as at the end of 1912, to one to 10 as at the end of 1913. The ratios varied widely on the different groups, the Gold Fields controls showing the highest percentage of white labour, and the Goerz the lowest. The ratios were: Gold Fields controls, one to 8·9; Rand Mines, one to 9·1; Neumann, one to 9·1; Barnato, one to 15·6; and Goerz, one to 26·9. In respect of working efficiency, surface employees showed no change, but there was a decided improvement in the efficiency of both white and coloured underground employees, with the result that the tonnage mined, relative to the number of men at work, was greater than in the preceding year.

* * * *

Our Coal Output.

Sixty-three collieries contributed to the coal output of the Union last month, which was 725,143 tons of a value of £190,575. In point of value this is the largest return recorded for the past eight months, although in actual tonnage the December output of 757,396 tons was greater. Prices generally were lower last month, the selling price at pit's mouth in the Transvaal averaging 4s. 4·76d. per ton, in Natal 6s. 6·85d., and in the Orange Free State 5s. 7·85d. Both the Transvaal and Natal, however, recorded an increase in tonnage output, the Transvaal production advancing from 420,284 tons in February to 426,963 tons in March, and that of the "Garden Colony" from 215,468 to 238,513 tons. In the Transvaal 28 collieries were producing. Of these, 15 were situated in the Middelburg area and contributed 335,035 tons out of a total of 426,963 tons. It is worth observing that in the Springs-Brakpan area 30 per cent. of the coal mined was rejected as waste, whereas in the Middelburg fields 11 per cent. was sorted out.

* * * *

Native Labour Recruiting.

The annual meeting of the Witwatersrand Native Labour Association was held this week, and as usual the Chairman reviewed the labour position at some length. He showed that at the end of March, 1914, there were 8,438 tropical natives still employed on the mines, and the death-rate among them from disease had dropped to 21·76 per 1,000 per annum, an improvement in the rate of mortality which is highly satisfactory. Regarding recruiting prospects, the Chairman pointed out that the general manager was of opinion that the natives were to some extent affected by the disturbances, and that fact, together with the prospect of good crops, might tend to keep more natives than usual from coming out to work. In addition, there was the increased demand for labour within the Province of Mozambique for railway construction and wharfage work. In reference to Sir Almroth Wright's recommendations, arrangements were being made for the carrying out of an experiment on a large scale with the object of showing conclusively whether inoculation against pneumonia would give beneficial results. The building of the South African Institute of Medical Research would be completed about the middle of the year, and the institute would be of inestimable service in dealing with the health questions of the Rand.

* * * *

A "Gassing" Accident at Randfontein.

A somewhat remarkable accident, which, fortunately, was not attended by more serious consequences, occurred at No. 8 shaft of the Randfontein Central G.M. Co. on Wednesday afternoon last. The accident resulted in a Government Mining Inspector and several of the technical heads of the Randfontein Central Company being gassed by the fumes of a new explosive which was being experimented with. The members of the party conducting the tests were Mr. Malcolm Fergusson, Government Inspector of Mines; Mr. C. A. Ferguson, general manager of the Randfontein Estates; Mr. Thacker, manager of the northern section; Mr. Jones, manager of the southern section; Mr. Wonnacock, underground manager of the southern section; Mr. Johns, underground manager of the northern section; Mr. Thomas, mine captain of the Central; and Mr. Evans, a miner. The result of the inquiry into the extraordinary affair will be awaited with interest.

* * * *

Base Metal Outputs for March.

Features of the statistics published by the Mines Department of the Union for last month are the returns from Base Metal Mines in the Transvaal which disclose record sales and shipments. The output of copper in the Transvaal during March was 1,429 tons, containing 41.7 per cent. metal, whilst the output of tin was 389 tons containing 64·55 per cent. metal. The sales and shipments were:—Copper, 1,645 tons, value £40,025; tin, 355 tons, value £34,492; total value, £74,517. This is the largest amount of base metal ore ever sold and shipped in the history of the Transvaal, and it is worth noting that the annual rate of production based on last month's output is approximately £900,000 per annum. The increased production is in the main due to the advance in the output of the Messina Company, which has registered steadily increasing returns since the starting up of the new concentrator plant and smelters a few months ago. The returns as to sales and shipments of Transvaal copper since November last well illustrate the marked increase in output from the extreme Northern Transvaal mine:—November, 476·4 tons, value £12,858; December, 733·3 tons, value £17,788; January, 907·6 tons, value £23,412; February, 1,494·1 tons, value £35,016; March, 1,645·0 tons, value £40,025. The sales and shipments of tin for the Union last month at £35,394 were about £1,000 better than for February. In the Cape the Namaqualand mines produced 1,229 tons, containing 47·25 per cent. of metal, but no sales or shipments are recorded. From that Province 8 tons of tin ore, containing 75 per cent. of metal and of a value of £902, were sold and shipped.

* * * *

The "C.M.S." Year.

From London by this mail comes the annual report of the Consolidated Mines Selection Co., Ltd. As usual it is accompanied by an incisive analysis of the year's work on the whole Rand, for which we are, doubtless, indebted to Mr. W. L. Honnold. In submitting their report and accounts for the year, the directors draw attention to the unsatisfactory conditions which prevailed during the whole of the period. Political disturbances, monetary stringency, and labour unrest in South Africa, contributed to create an almost unprecedented state of affairs. "This, together with the absence of interest in mining, made new business extremely difficult, and resulted in materially lower prices, which has made it incumbent upon the directors to set aside a large sum from profits for the purpose of writing down certain assets. Although the profit for the year has been thus reduced, the directors are able to recommend the payment of a dividend of 5 per cent." Advantage has again been taken of the opportunity to purchase some of the company's debenture bonds; the amount outstanding as at 31st December last is in consequence reduced to £113,860. The accounts show a profit of £53,512 6s. 9d., including £10,623 3s. 4d. brought forward from last year. The directors recommend that a dividend of 5 per cent. (free of tax) be paid, and that the sum of £15,000 be placed to reserve account, leaving a balance of £10,887 6s. 9d. to be carried forward. The company's financial position remains satisfactory, the cash and cash assets exceeding current and contingent liabilities by £182,228 10s. 8d. Properties and unquoted securities stand in the books at £80,679 3s. 2d., and quoted securities taken at cost or under, but in no case higher than the market price at 31st December, 1913, amount to £471,464 12s. 11d. —£552,143 16s. 1d. At the prices ruling at 31st December, 1913, these assets show a further substantial unrealised profit. The net profit for the year ending 31st December, 1913, amounts to £42,889 3s. 5d., arrived at as follows:—Net profits realised on sales, commissions, etc., £27,400 18s.; interest and dividends, £68,054 0s. 4d.; transfer fees, £186 17s.; profit on own debentures purchased, £109 10s.—£95,751 5s. 4d. Against which have been written off:—Expenses, etc., £13,057 17s. 11d.; debenture interest, £5,693 10s.; cost of investigations, claim licences, and depreciation of office furniture, £1,394 14s.; written off sundry share accounts, £32,716—£52,862 1s. 11d.; leaving £42,889 3s. 5d., which, with the credit balance from last year of £10,623 3s. 4d., gives a total available profit of £53,512 6s. 9d.

* * * *

Shamva and Cam and Motor Initial Returns.

Interest in regard to mining in Rhodesia is at present concentrated on the initial returns of the two new large producers of the country—the Shamva and the Cam and Motor—and it it a fact calling for mention that whilst the former concern has given a first return which indicates a recovery substantially above the value of its developed ore, the Gatooma proposition's initial declaration is below the average value of the ore reserves of that mine. Thus at the Shamva the ore reserves at September 30 last were given as 21s. 3d. per ton assay value (reduced) in respect of 2,405,796 tons. Allowing for absorption, it is estimated that a recovery of about 26s. 3d. per ton is indicated. At the Cam and Motor the ore reserves are given at 900,000 tons of an assay value of 45s. per ton. The full text of the announcement as to tonnage and value secured from the first run of the mill for the broken period from its start on February 28 was as follows:—Tons crushed, 10,693; value recovered, £16,643, including £800 in slags; estimated value in solution, £266. This appears to indicate an extraction of between 31s. and 32s. value per ton treated, which, as indicated above, is a good deal below the estimated value of the ore in reserve. However, as the new plant gets into better running order it is probable that a higher extraction will be secured.

TOPICS OF THE WEEK.

TRANSVAAL LANDOWNERS' ACTIVITIES

The annually increasing multiplicity of interests embraced by the Transvaal Landowners' Association is a welcome sign of the growing importance of the farming industry. The Association is now in its twelfth year; and its history, since its inception after the War, is at once the record and epitome of the continuous advance of the land-owning interest in the Transvaal. The annual report of the Association has come to be looked upon as a year-book of all matters affecting the land, and the annual address of the President takes rank among the most important of its kind each year. Nor is it too much to say that the present report is quite the most valuable and comprehensive we have seen: and Mr. Massey's valedictory address as retiring President was in no way behind its predecessors. Of the variety of matters discussed, it seems to us that land settlement, the Native Land Act, and the future of the Transvaal as a stock-raising country, were the most important. To take the last first, the possibilities of this Province as a cattle-producer are every day becoming more encouraging, and the Landowners' Association is to be commended for giving its members and the country generally a sound lead on the subject. In the recently-issued annual report of the Transvaal Consolidated Lands, the Land Manager of that Company—Captain Madge—who, by the way, is the new President of the Landowners' Association, drew attention to the progress lately made in this direction. The excellent prospects of the big Rhodesian ranching companies, and the rush to secure ranches in Swaziland, have attracted further attention to the matter. The result is that the Transvaal Landowners' Association foresee big developments for the industry. But it is essential that progress be made along proper, scientific lines. "There are many desiderata to be achieved," said Mr. Massey, "before we reach the prosperity of the Argentine, Australia and New Zealand, the chief of which are: (1) Better grade of stock; (2) protection from disease; (3) co-operation. Now each of these principal factors calls for serious consideration. Government assistance is required, not in the shape of subsidies, but in wise legislation, veterinary advice, insistence on precautionary and remedial measures against disease, and a realisation that co-operation in its best sense between Government and people, and among the stock farmers themselves, will alone achieve the desired results. Governmental action in encouraging, assisting and directing co-operation, and affording the capital required for the export trade in meat security and return for its investment, is necessary, but still more necessary to avoid what has taken place in other countries to the detriment of the farmer." With Mr. Massey we sincerely trust that the Government will seriously consider the suggestion made in the report regarding the appointment of a Commission to investigate and report on the best methods to be pursued to establish the meat exporting industry on sound lines. In regard to the Native Land Act, Mr. Massey had some weighty advice to offer the Government: and certainly no one is in a better position to give sound advice than the representative of such important landed interests. On the vexed question of land settlement, the Association adopts a sensible middle course. It steers successfully between the twin dangers of wholesale, indiscriminate emigration on the one hand, and on the other, is far removed from the Government's attitude of hidebound inarticulate opposition to the whole idea of introducing fresh blood. In fact, the Association can point to a record in this direction of good work well done. It appears that 23 members during 1913 sold no less than 459,646 acres of land to settlers. The same members have no less than 535 white tenants on their farms, and during the year 30 tenants purchased the land leased by them. In view of this Mr. Massey was able to offer some reassuring advice to the Government and its supporters. "Our friends in South Africa," he said, "have really nothing to fear—although they do not see it—from competition from oversea immigrants. The world's markets are before us, and the demand from England and Europe for the commodities we can supply is enormous and increasing." This is, of course, the plain commonsense of it, though Mr. Massey's mild rebuke will scarcely succeed in disabusing the minds of the Government or of its friends. The fact remains, however, that the Landowners' Association are doing a good deal on their own initiative to unlock the land; and by their example and influence they may succeed in doing a great deal more. In every direction, indeed the weight of the Association is thrown on the side of progress; with a reward, we note, both immediate and tangible in the form of increasing utility to its members and growing influence in the counsels of the Government, the land companies and the farming community

THE YEAR WITH RAND TRADE AND COMMERCE.

THE review of Rand trade and commerce with which Mr. H. W. Soutter marked the close of his year's occupancy of the Presidential chair of the Rand Chamber of Commerce was worthy of the greatly increased importance and prestige of the Chamber. The year was no less difficult for commerce than for industry on the Rand; and Mr. Soutter is to be congratulated on his successful handling of the commercial helm entrusted to him as well as on the higher plane to which he lifted the discussion of commercial questions. His address on Tuesday was certainly dignified and authoritative, putting the case for commerce with clearness and force, while maintaining a broad and comprehensive outlook on affairs generally. His optimism is of the robust variety that extracts comfort even out of the trials and rebuffs of the past year; and his words will doubtless do much to reassure oversea critics and observers in regard to the prospects of our trade and industry. Since its amalgmaation with the Chamber of Trade, the Chamber of Commerce has enjoyed the privilege and responsibility of voicing the views of the whole commercial community of the Rand; and the utterances of its President have, therefore, to-day an added and unique value and authority. Mr. Soutter regards the fact that the recent unrest and dislocation have not had a more serious influence upon the trade of the Union generally as a cause for congratulation, and a striking proof that the country is established on a firm and broad foundation, and he thinks we need have no fear of the future prosperity of the Union. "We in Johannesburg," he says, "and indeed the whole of South Africa, regard the mining industry as to-day the most important part of this foundation. As far as we can judge, with improved methods of mining, and improvements in the conditions of the miners, there is reason to expect development of properties along the Reef, which means so much to the commercial community of the whole Union. It is to the mining industries in the past that South Africa has largely owed its wealth and progress, but it is now awakening to the fact that a more permanent source of wealth and a broader basis of progress lies in front of it in the development of the soil itself by agricultural industry." Mr. Soutter enters a powerful plea for the adoption by the Government of a consistent national policy pursued year after year to develop the agricultural resources of the country. The full importance to the commercial community of a real and progressive agricultural policy such as this, he points out, is not only to supply the needs of the white population, but will give encouragement to other industries until South Africa will become largely a self-supporting Dominion, as far as the necessaries of life are concerned. Mr. Soutter believes that things are moving very rapidly in this direction, and, while the trade conditions to-day may be depressing, yet he thinks that in the near future we shall enjoy a return of prosperity on a much sounder basis than any of the past periods of plenty, which have been largely due to the expenditure of capital from oversea for specific purposes. In reviewing the year's trade in Johannesburg, Mr. Soutter makes it clear that in the first half of 1913 there were indications of a decided improvement over the previous year, though the upheavals, of course, caused the complete year to be a disappointing one. "We are still suffering from the effect of these upheavals," he says, "but I do not consider that there is room for unnecessary pessimism, certainly not for panic." An important feature of the trade in Johannesburg, noted by both Mr. Soutter and Mr. Chappell, is the marked increase in the distribution of goods from this centre during the past six years. In that period the volume of goods distributed from this centre has doubled, and Johannesburg is being regarded more and more as the best point in South Africa for this trade. Merchants here are recognising this, and, notwithstanding the handicap as against the coast of railway carriage, are meeting the demands of the country buyers, who are realising that the sorting up trade can be done here more satisfactorily than elsewhere. This point was emphasised by Mr. Chappell, who declared that there was no reason why, if they pressed on the work on the right lines, and if the S.A.R. reduced their handicap a little, they should not make Johannesburg the Chicago of South Africa as far as the inland distribution trade was concerned. In estimating the volume of the trade of the country, Mr. Soutter shows that what is of more importance than railway earnings, which are subject to many incidents which it is not easy to follow, is a comparison of the total tonnage carried by the railways. By the courtesy of the general manager, the figures of 1913 have been provided, and the total tonnage carried last year was 12,671,256 as compared with 11,747,598 in 1912, and 11,080,075 in 1911, an increase over 1912 of no less than 923,658 tons. The figures for January of this year only are available, and the tonnage for that month was only 915,744, as compared with the monthly average of 1,055,938. With regard to traffic to the competitive area, attention was drawn to the fact that for the year ending 1913, the percentages for the various ports were as follows:—Cape, 14·61 as against 13·56 last year; Natal, 34·00 as against 31·01; and Delagoa Bay, 51·39 as against 59·43. With regard to the recent Conference on Harbour charges, Mr. Soutter points out that the Chamber is utterly disappointed at the limitation of the scope and effect of the proposals generally. "They involve," he says, "the making of very many changes, and the consequent disturbance of present working conditions, but they entirely fail to remedy the most important, viz., the inequitable manner in which the burden of the losses on the working of the harbours is thrown upon the people of the inland Provinces—by the fact that railway profits have to make up harbour losses." In taking up this stand, the Chamber of Commerce has, of course, the support of the whole Rand community. The Chamber's attitude on the vexed question of the closed compound system is, of course, more debatable, since considerations other than those of commerce play so large a part. Otherwise one has nothing but enthusiastic approval for the views so admirably expressed on such a diversity of subjects by Mr. Soutter. He voices not only commerce but the whole community, and he has rendered a public service by speaking out loud and clear (at a time of some doubt and hesitation) on the inherent soundness and stability of the credit of the country.

Klerksdorp "Props."

The Klerksdorp Proprietary Co., Ltd., proposes reducing the capital from £150,000 (in 600,000 shares of 5s. each) to £50,000 (200,000 shares of 5s. each), and paying out 2s. per share to the present shareholders, who will receive one share for every three now held. The proposal will be submitted to shareholders at an extraordinary general meeting, to be held immediately after the annual general meeting on May 18. The accounts show that the sum of £40,807 16s. 3d. has been written off in respect of depreciation on shares (£32,630 13s. 1d.), and debentures (£8,177 3s. 2d.). No less a sum than £25,200 is represented by the depreciation of Main Reef West shares held by the company. The directors' report states: "In regard to this asset, your Board have much pleasure in informing you that the latest reports from the mine as to developments are of a distinctly more encouraging nature, and it is hoped that in the near future this asset will gradually increase in value."

THE RAND'S ORE RESERVES.

One Hundred and Fifteen Million Tons of Profitable Ore Developed—Figures for Groups and Individual Mines—Reserves Nearly Five Years Ahead of the Mills—£155,000,000 in Gold Awaiting Removal.

We print hereunder our usual annual table of Rand ore reserves. The figures given below reflect the position in regard to ore developed as at December 31st, 1913. Where figures at this date are not available, the statistics are culled from the last annual reports published. Recently we dealt with the Rand's ore reserves and contrasted the tonnages and values at the end of 1913 with those declared in respect of the end of 1912. At that time, however, we were unable to give as full and complete a list as at present, as certain important companies had not then issued their reports. We are now enabled to give a practically complete list. In the cases of some mines tonnages are segragated according to value.

Ore Reserves of the Groups.

The tables given herewith classify the ore reserves of the mines according to the various controlling houses or groups, and deal with only "payable," fully exposed, and fully valued tonnages, except in one or two special instances. The group aggregates are as under:—

Group.	No. of Mines.	Tons.
Central Mining & Investment Corporation	15	39,292,628
Consolidated Gold Fields of S. Africa ...	5	9,935,000
East Rand Proprietary Mines	1	5,600,000
Anglo-French Exploration Company ...	2	1,841,654
Consolidated Mines Selection	1	2,242,000
Randfontein-Langlaagte	2	10,147,969
General Mining and Finance Corporation	7	6,990,766
Johannesburg Consolidated Invest. Co...	9	7,674,183
S. Neumann & Co.	5	4,195,500
A. Goerz & Co.	5	4,067,550
Independent Company	1	581,795
	53	92,569,045

Group totals at the end of 1912 were:—

Group.	No. of Mines.	Tons.
Central Mining & Investment Corporation	15	38,563,916
Consolidated Gold Fields of S. Africa ...	5	8,655,403
East Rand Proprietary Mines	1	6,013,000
Anglo-French Exploration Company ...	2	1,687,101
Consolidated Mines Selection	1	2,457,000
Randfontein-Langlaagte	2	8,970,639
General Mining and Finance Corporation	7	6,808,889
Johannesburg Consolidated Invest. Co....	8	6,740,909
S. Neumann & Co.	5	4,268,634
A. Goerz & Co.	4	2,721,500
Independent Company	1	500,471
	50	87,387,462

The list this year is not quite complete, inasmuch as up-to-date figures for four companies are not at the moment of compilation to hand, because annual reports for last year are not available. The companies in question are the Robinson, Robinson Deep, City and Suburban, and Village Main Reef, and in order to frame a calculation for the whole Witwatersrand we have estimated the reserves of these companies at the same tonnages and values as were given in the reports for the year ending December 31st, 1912. The grand total arrived at for the end of last year is, it will be observed, 92,569,045 tons. If to this total of ninety-two and a half million tons be added ore partially developed or partially valued, the great bulk of which may be assumed to be "payable," and there be also added the tonnages of pay rock awaiting mining in a few comparatively unimportant mines not included in the above, a grand total of about one hundred and fifteen million tons is arrived at. It should be noted that in this year's table figures for two mines—the Modder Government Areas and Modder Deep Levels—which twelve months ago were not sufficiently developed to admit of inclusion in our annual table are given. In addition there is now a moderate tonnage blocked out in the Springs Mines, but at this proposition, although 2,700 feet were sampled disclosing an average value of 8·5 dwts. over 32·7 ins., development at the end of last year was not sufficiently advanced to admit of classification as to "payability" or to justify tonnage estimates.

Features of the Year's Work.

As compared with 1912 totals an increase is to be observed in the aggregate tonnage blocked out, which, although much more satisfactory than was generally anticipated, is nothing very significant or important. Neither is any appreciable difference to be observed in the assay value. During the past twelve months the mines have continued to be engaged in bettering underground working conditions and meeting the continued shortage of native labour by strenuous endeavours to substitute mechanical appliances wherever possible, rather than in advancing development to any remarkable degree, except at certain properties. The existing legislation does not encourage companies to advance development very much ahead of the mill. Development operations were, of course, much hampered by the strike in July, and the unsatisfactory labour conditions that continued until the end of the year as a result of the strike. It may also be remarked that the majority of Witwatersrand mines are now in a strong position with regard to ore reserves, and, taking the aggregate reserve for the whole Rand at 115,000,000 tons on mixed milling and mining bases of estimation, and the annual rate of crushing at twenty-five million tons, the ore blocked out is almost five years ahead of the combined batteries. During the past year some companies largely increased their tonnages in reserve, notably one or two mines under the control of the Johannesburg Consolidated Investment Co. On the other hand, some companies, through encountering poor zones, show a decline. The influence of working costs must here have to be taken into account—the raising of the pay limit consequent on higher working expenditure meaning a decrease in reserve, and *vice versâ* a lowering in that factor (as a result of decreased costs) an increase in the total. Another feature of the year's work calling for remark has been the improvement in value of reserves recorded by the Modder B., New Modderfontein, Van Ryn Deep, and City Deep Companies.

Figures for the different mines are as follows:—

Central Mining and Investment.

	Dec. 31, 1912.		Dec. 31, 1913.	
Bantjes Consolidated	840,800	7·0	974,700	6·3
City Deep	1,914,540	8·7	2,167,650	10·0
	209,110	8·6		
City and Suburban ...	773,300	8·4		
Crown Mines	10,607,670	7·1	10,449,000	6·82
Durban Rood. Deep	965,300	6·7	1,312,700	6·7
	340,800	7·3		
Ferreira Deep	2,070,900	9·4	1,974,000	8·7
Geldenhuis Deep ...	1,904,700	6·3	1,669,500	6·4
Modder B.	2,594,000	7·2	2,800,400	8·3
New Heriot	590,742	8·1	581,124	8·1
New Modder	3,900,000	8·1	4,351,000	8·2
Nourse Mines	1,969,000	6·6	1,795,600	6·6
Robinson	1,130,600	11·0		
	242,500*			
	1,160,800†	4·3		
Rose Deep	3,695,100	6·1	3,828,400	5·8
Village Deep	2,235,300	6·9	2,662,600	6·6
Village Main Reef ...	1,418,754	8·8		
	38,563,916		39,292,628a	

* Old workings, stope and shaft pillars, etc. † Main Reef.

a Robinson, City and Suburban and Village Main Reef tonnages taken at previous year's figures.

Consolidated Gold Fields of South Africa.

	Dec. 31, 1912.		Dec. 31, 1913.	
Jupiter … … …	1,270,000	4·4	1,273,000	4·5
	101,000	4·0	161,000	4·1‡
Knights Deep … …	1,477,414	4·47	2,787,000	4·3
Robinson Deep …	1,114,000	6·7		
Simmer and Jack …	2,680,000	6·2	2,524,000	5·4
	438,000	5·3	406,000	4·7
Simmer Deep … …	1,430,693	4·2	1,416,000	4·25
	144,296	4·08	254,000	4·4‡
	8,655,403		9,935,000b	

‡ Partially developed and of value indicated.

b Robinson Deep tonnage taken at previous year's figure.

E.R.P.M.

East Rand Prop. …	6,013,000	6·8	5,600,000	6·7

Anglo-French Exploration Company.

Apex … … …	496,138	6·18	496,138	6·18
New Kleinfontein …	1,190,663	7·59	1,345,216	7·53
	1,687,101		1,841,654	

Consolidated Mines Selection.

Brakpan Mines …	2,457,000	6·74	2,242,000	6·7

General Mining and Finance Corporation.

Aurora West … …	556,163	5·1	554,909	5·69
Cinderella Cons. …	573,000	6·7	613,000	6·35
	304,000		24,000	7·36
			207,000	Suspense
Meyer & Charlton …	341,745	12·0	471,844	11·7
New Goch … …	957,600	5·1	917,088	5·16
Roodepoort United …	379,283	5·08	370,732	5·3
	100,000	6·34	189,348	5·3
Van Ryn … … …	2,064,500	6·42	2,064,529	6·5
	89,365	5·24		
West Rand Cons. …	1,116,733	6·02	1,364,956	6·16
	326,500		213,360	
	6,808,889		6,990,766	

Randfontein-Langlaagte.

Langlaagte Estate …	1,370,639		1,512,359	
Randfontein Central	7,600,000	6·2	8,635,610	5·8
	8,970,639		10,147,969	

Johannesburg Consolidated Investment Company.

Cons. Langlaagte …	2,069,630	6·4	2,194,408	7·4*
Ginsberg … … …	316,681	6·9	312,540	6·0
Glencairn … …	761,000	3·5	587,920	3·6
New Primrose … …	413,033	6·5	401,015	6·2
New Rietfontein …	135,887	6·5	51,737	7·55
	130,107			
New Unified … …	275,028	6·4	387,500	5·9
Witwatersrand …	1,331,540	6·1	1,225,688	6·4
Van Ryn Deep …	1,278,003	7·1	1,953,845	8·6
Modder Govt. Areas	—		559,500	6·6
	6,740,909		7,674,183	

S. Neumann & Co.

Cons. Main Reef …	610,680	7·2	611,470	7·3
Main Reef West …	685,720	6·3	591,830	6·02
Knights Central …	647,000	6·1	539,100	6·0
Wit. Deep … …	1,492,257	6·83	1,666,000	6·8
Wolhuter … …	832,977	6·48	781,100	6·1
	4,268,634		4,195,500	

A. Goerz & Co.

	Dec. 31, 1912.		Dec. 31, 1913.	
Geduld Proprietary…	1,475,000	6·98	1,757,000	6·9
	116,000	5·79	106,000	6·3
Lancaster West …	335,500	6·1	335,500	6·1
May Consolidated …	133,000	6·64	61,350	6·33
	25,000	8·49*	20,700	9·9§
Princess Estate …	637,000	7·21	614,000	7·2
Modder Deep Levels	—		982,000	7·0
			191,000	10·5
	2,721,500		4,067,550	

Independent Company.

Luipaardsvlei Estate	500,471	5·7	581,795	5·54

§ Shaft pillars.

Lack of Uniformity in Recording Figures.

On previous occasions we have referred to the lack of uniformity noticeable amongst Rand mining companies in recording ore reserves, and this year we feel constrained to refer once again to this matter, for in the reports now before us there appears to be even less standardisation of method in regard to the segregation of tonnages according to "payability," whether fully developed, partially developed, fully or partially valued, and whether calculated on a stoping or a milling width, than in previous years. In regard to the calculation of reserves and values on stoping and milling widths, the difference in method of computation again calls for a few words by way of explanation. This is well illustrated in the case of the Van Ryn Deep report, and the reports of other subsidiary companies of the Johannesburg Consolidated Investment Company. It is explained in the Van Ryn Deep's report that the reserve of that company, on a basis of stoping tons, is given as 1,953,845 tons of an assay value of 8·6 dwts. This tonnage is on the basis of an average stoping width of 55 inches. Allowing for 15 per cent. sorting, the milling tonnage stands at 1,660,767 tons of an assay value of 10·1 dwts. Of course, the limit of "payability" varies greatly in different mines, and the ideas of the technical controllers of the different mines vary in regard to the segregation of tonnages and the declaration of reserves accordingly in annual reports. Hence this lack of uniformity is mainly of academic interest, but it is a very material difficulty in the compilation of such a comprehensive table as is given above.

A Vast Hoard of Gold.

We do not propose to hazard any hard-and-fast figures as to what this vast tonnage of ore—this enormous stock-in-trade of the industry—may mean to shareholders in dividends, or to the country in working costs. Obviously the accumulation of such a colossal tonnage of profitable ore ready for stoping makes for industrial stability. Even so, the Rand is still largely at the mercy of legislation, labour difficulties, and a thousand and one other factors. It is, in fact, at the caprice of the Government, the agitator, and the "coloured gentleman" to a degree which deters us from venturing predictions as to the ultimate dividend value of the one hundred and fifteen million tons above arrived at. We may, however, with some degree of confidence, advance the estimate that this tonnage contains gold of a total recoverable value amounting to about £155,000,000. In the above calculations no account has been taken of the many millions of tons of low-grade ore—the accumulations of years of exploitation—which are standing developed in the mines. Much of this low-grade ore is verging on the profit line. It needs but a happy swing of the pendulum of the industrial clock to transfer several millions of tons from the unprofitable to the profitable side of the Rand's ledger.

The list of certificates issued by the Mines Department for the fortnight ended 11th April, 1914, is as follows:—Mine Overseers (Metalliferous Mines): F. R. Sievwright, E. R. Thomson, B. H. Hoyer; (Collieries) T. J. Thomas.

SECURITY OF THE RAND'S UNDERGROUND WORKINGS.

A Much Improved State of Affairs—What Waste Packing and Sand Filling on a Large Scale Have Achieved.

Simultaneously with the very whole-hearted and successful efforts of the various mining companies to improve ventilation and health conditions generally underground during the past few years, there has been waged an important "safety first" campaign in regard to security of mine workings on the Rand and the support of the hanging wall. The results of activities in this direction have been scarcely less noteworthy or satisfactory than those achieved in regard to the allaying of dust and the improvement of both the quantity and quality of air circulating through underground workings. The public generally do not adequately realise the amount of work that has recently been undertaken in the direction of improving the safety of underground shafts, drives and stopes, but at any rate it is common knowledge that a year or two ago the condition of a number of important points in the Ferreira Deep and Robinson Deep, amongst other mines, was far from satisfactory, whereas to-day the underground workings of these propositions leave but little to be reasonably desired in regard to security.

Sand Filling on a Large Scale.

Many thousands of tons of sand have been sent down into a number of the older mines of the Witwatersrand, and this tailing has been employed in packing old stopes. The Crown Mines, Village Main Reef, Simmer and Jack, Robinson Deep, and Wit. Deep have, amongst other concerns, practised sand filling extensively, and as an indication of the extent to which the lowering of sand is being carried out on the Witwatersrand to-day, it may be remarked that in 1912 on seven mines of the Central Mining and Investment Corporation, 984,650 tons of sand were lowered into worked-out stopes at a total cost of 1s. 3·36d. per ton. Last year this, the leading mining corporation of the Rand, continued sand filling work on subsidiary properties, and at the Crown Mines alone nearly a quarter of a million tons were filled into worked-out areas. At the Robinson Deep mine practically all the current sand is to-day being lowered into the mine and employed in packing worked-out stopes, thereby greatly improving the security of the workings. To indicate what other mines are doing in this respect, it may be remarked that in the Geldenhuis Deep property packing underground and sand filling have been proceeded with under the South African Railways as well as elsewhere in the underground workings. In all 85,000 tons of sand were lowered into the workings of this property last year. At the Rose Deep operations were interrupted on account of the sinking of No. 1 shaft, but at this mine there were filled into old workings at intervals during the year 50,725 tons of sand. At the Wit Deep current sand only is being sent down into the mine and up to the end of January last 328,645 tons had been put into the mine at a surface cost of 3·82d. and an underground cost of 3·74d., making a total cost of 7·56d. per ton of sand filled.

Effect on Accidents.

It is impossible to say at this juncture what the exact influence of all this sand filling activity has been on the reduction of accident rates from falls of ground, but since falls of rock have been amongst the most plentiful sources of accidents in the mines of the Main Reef series during the past it can only be supposed that the diminution of dangers in this regard has been not the least important cause of the decline in accidents generally which has been such a noticeable and gratifying feature of recent Mines Department statistics. Apart from sand filling, it is instructive to learn of the amount of work carried out in timbering, packing away waste rock underground, and in connection with leaving adequate stope and shaft pillar supports.

Underground Waste Rock.

Of late years a tendency to sort out less rock at surface has been manifested and contemporaneously there has been more waste rock rejected underground and packed away into stopes and workings where the roof is insecure. Thus, the hanging wall in the Durban Roodepoort Deep mine is admittedly weak, and at this property just under 10,000 tons of waste rock were packed into stopes last year. Some mines are endowed with much more secure hanging walls than others, and where a structural weakness of roof is to be observed endeavours are of course made to maintain more waste rock underground and use this waste for packing than where the hanging is good. At the Robinson Deep much excellent work has been done in this respect during the last few years, and also at the Ferreira Deep, Knights Deep, and other mines. At the Knights Deep features of the underground workings are the enormous waste packs which have been put in many of the old stopes as supplementary to or in substitution for pillars.

More Careful Working.

Generally speaking, the hanging wall of the Rand is strong and secure, but in many of the older mines the enormous amounts of ground taken out have had a marked effect and at a number of points operations have had to be suspended, for a time, at any rate. In this connection, it is interesting to note from the Rose Deep Company's annual report the manager refers to the fact that owing to movements of ground it was deemed advisable to close down No. 3 shaft in October for a short period. Very little damage was done and the section was re-opened in December. Right along the Reef to-day it is very evident that much more attention is being paid to the security of underground workings than has hitherto been the case, and there is every reason for anticipating that as a result of the activity now evidenced in regard to sand filling, close timbering and packing waste, underground accidents in respect of falls of ground will show further decline in the near future.

MINING MEN AND MATTERS.

Dr. P. A. Wagner has left on a professional trip to German South-West Africa. He expects to be away for about six months.

* * * *

The death of Mr. A. Van Straubenzee, of Messrs. Sykes & Co., Ltd., occurred with painful suddenness last week-end.

* * * *

Mr. C. T. Eliott has been appointed Secretary of the S.A. Institution of Engineers. The annual dinner of the Institution takes place this evening, when a notable gathering is expected.

Mr. Walter McDermott has been re-appointed as the official representative of the Institute of Mining and Metallurgy on the governing body of the Imperial College; Mr. Edgar Taylor has been re-appointed as the official representative on the Board of Governors of the School of Metalliferous Mining (Cornwall); Mr. F. W. Harbord and Mr. A. G. Charleton have been appointed members of the Royal School of Mines Advisory Board in succession to the late Arthur C. Claudet and Professor Wm. Frecheville respectively; Mr. Bedford McNeill, Mr. Edward Hooper, Mr. H. L. Sulman and the secretary have been appointed as official representatives on the Executive Committee, and Dr. F. H. Hatch, Mr. W. Fischer Wilkinson, Dr. A. L. Simon and the secretary, have been appointed representatives on the Publication Committee, of the forthcoming International Congress of Mining, Metallurgy, Engineering and Economic Geology, London, 1915; Messrs. R. E. Commans and F. W. Harbord have been appointed on the recently formed General Engineering Research Committee; and Mr. R. E. Commans has been appointed on "The Standardization of Steel Wire Ropes" Committee of the Engineering Standards Committee.

MINE MODELS AND THEIR USES.

A Point Worthy of Consideration—The City Deep and Messina Models.

Mine models are of very considerable technical value in that they enable managers, mine captains and surveyors to take in at a glance the essential development features of a mine, to more accurately locate working points and to lay off future development more readily than by means of ordinary drawing office plans. This aspect of mining work has not so far received very much recognition on the Witwatersrand, possibly because the reef deposits are comparatively uniform. Nevertheless, since a number of properties are very much broken by faults and dykes, it is readily conceivable that models would be of material value to officials in determining underground policy. In the case of a proposition such as the Princess Estate, for example, where faults and dykes intersect such a large number of the claims, a graphic model would enable one to grasp the salient features of the underground "lay out" and to reason out the best methods of further exploitation more rapidly than by measurements off a mine plan, and if the model is made on an accurate scale, just as correctly. But in effect the function of a model should not be in substitution of a plan, but as a supplement to the drawing office work and for rapid and clear determination of the extent and state of the underground workings. Such a creation should be of inestimable value in a "round table" conference between manager, mine captain and surveyor in the setting out of drives, winzes, raises, and in plans for the stoping of new or old ground.

The City Deep and Messina Models.

It might here be explained that the mine model is quite a different thing to the model mine, but it is certainly not unreasonable to believe that the mine model may be of the greatest service and value in the making of the model or ideal mine. By reason of its graphic and realistic nature the mine model should enable the management to lay out drives, sink shafts, and put up winzes so that the best ventilation conditions are obtained and the work carried out is rendered as effective as possible. We believe, in fact, that a model of a mine should not be looked upon as a creation born of a little conceit or academic zeal on the part of the management; it can certainly be of very valuable and practical service, especially where erratic or faulted ore bodies have to be dealt with. In so far as the Witwatersrand is concerned, it may be of interest to learn that at the City Deep mine offices there is an excellent model of that important proposition in glass. But where irregular ore bodies are worked it is necessary to have some more or less plastic material to denote the bunching and contraction of the shoots, and this idea has been well adopted at the Messina Copper Mine in the Northern Transvaal, where a model of the workings of that property has been of service for some time past.

The Messina Manager's Views.

Mr. Woodburn, the manager, has, however, recently constructed a new model, and at the discussion of his paper on "Mining Copper Ores at Messina," read before the Chemical, Metallurgical and Mining Society of South Africa, Mr. Woodburn had some interesting remarks to make in regard to this new model. He said: "I have promised to send a model I have made of the mine to the forthcoming Exhibition. I am doing this in the hope that models of mines will be made more frequently than they have been in the past. I have had some experience of trying to make models of peculiar, vertical, erratic reefs, and I have had great difficulty indeed in getting them to represent the actual conditions so that anyone could recognise them; but I think this time I have been able to make a model which, at least, is an improvement on many of the models I have yet seen. A photograph of the model is reproduced here. I hope when it is at the Exhibition that it will receive some attention, so that further improvements can still be made, because we at Messina found it invaluable to the surveyor, the mine captain and myself in following up the development of the mine and in laying off future development; and if further improvements, which I feel sure can be made, are made, that in many mines, especially where the ore-bodies are faulted, or lying at varying inclinations, valuable assistance will be got by having a model made, in addition to keeping plans and sections. I hope those who are interested in mining will criticise this model, and suggest any improvements which they think may be helpful." The Chairman, in commenting on this, remarked: "I am sure we are very much indebted to Mr. Woodburn for his promise to show this interesting model at our Exhibition, and I think, at the same time, that it will serve as a lead to many others of our members to come forward with models of the mines with which they may be connected, or with appliances employed thereon."

Brakpan Mines.

Results for the quarter ended March 31st, 1914:—Revenue, £192,980 19s. 3d., or 27s. 8d. per ton, from 139,329 tons milled; cost, £135,194 14s. 11d., or 19s. 4d. per ton; profit, £57,786 4s. 4d., or 8s. 3d. per ton; yield, mill 23,182 ozs., from cyanide 17,601 ozs.; yield per ton, 6·523 dwts. The linear development for the quarter amounted to 5,113 feet, of which 3,885 feet were on reef averaging 5·57 dwts. over a reef width of 32·37 inches. Of the footage on reef, 1,140 feet were in payable areas, and averaged 10·13 dwts. over 43·98 inches. The capital expenditure incurred during the quarter amounted to £1,333 6s. 1d., and the excess expenditure on development to £1,514 13s. 7d.

New Kleinfontein.

The report of the directors for the quarter ended 31st March, 1914, shows that for revenue and expenditure the total working costs were £126,749 18s., or 18s. 2.691d.; while the working profit was £58,020 3s. 7d., or 8s. 4.107d. Development: No. of feet driven, risen and sunk (excluding shafts), 3,619 feet; footage sampled, 1,975 ft.; average mining width, 53.90 ins.; average assay value (mining basis), 5.72 dwts.; estimated tonnage of ore exposed by drives, etc. (mining basis), 157,342 tons. Ore Treatment: Tonnage mined, including ore obtained from development faces, 174,851 tons; less sorted out (20.25 per cent.), 35,424 tons; tons to mill, 139,427 tons; deduct added to ore in bins, 327 tons; ore milled, 139,100 tons. Capital expenditure: The expenditure for the quarter was as follows: Shaft sinking, £1,308 4s. 3d.; surface equipment, etc., nil; total, £1,308 4s. 3d Ore Reserves: The payable ore reserves at the end of the quarter on a mining basis were as follows:—Payable: 1,654,169 tons; mining width, 58.19 ins.; value, 6.18 dwts. Unpayable: 620,829 tons; mining width, 56.08 ins.; value, 2.92 dwts.

Frank Smith Diamonds.

For the month of March the results were as follows:—60,046 loads washed, yielding 2,503 carats. Recoveries for the previous three months:—Carats found in December, 1913, 1,815; January, 1914, 2,310; February, 1914, 2,160.

Electric Blasting,

Mr. W. Waters read on Saturday night the joint reply drafted by Mr. William Cullen, Mr. Thomas Donaldson and himself to the Chemical, Metallurgical and Mining Society, on the subject of electric blasting. Among other things, the joint signatories to the reply stated: "It is only fair to ourselves to state that the original paper is the result of information and observations carried out over a number of years, and that for a few months prior to it being written an average of six competent, qualified, scientific observers were constantly at work on experiments connected with it. We also desire to say that we do not think for a moment that electric blasting is a panacea for all difficulties attaching to mining. We know only too well that it would be a fallacy to recommend its introduction into some mines or even sections of mines, but having said that, we stand by our original statement. We re-affirm the statement that the smoke of a fuse does hold fine dust in suspension because the dust itself is made up of small tarry globules." In conclusion they stated: "We hope that the discussion of our paper will enable mining men to look on the subject of blasting generally in a new light, and we truly believe that the time is not far distant when, to quote Mr. Chilton, the breaking of rock will be in the hands of a few carefully chosen miners on each mine, who will commence to load up the holes after the drilling-shift has done."

THE MANAGER AND STAFF OF THE KNIGHTS DEEP, LTD.

Sitting on ground: E. J. Jones, Ticket Sorter; I. Goldman, Ticket Sorter; B. Benton, Telephone Operator; J. Wilson, Telephone Operator; J. Swart, Telephone Operator.

Bottom row (sitting)—left to right: W. O. Powys, Chief Storekeeper; R. H. S. Tudholme, Resident Secretary; C. J. Grobler, Shift Boss; T. W. McConaghy, Accountant; A. J. Herald, Mill Manager; A. L. Webb, Mine Captain; A. D. Arnold, Foreman Shop Fitter; F. Mervyn-Smith, Underground Manager; G. A. Chalkley, General Manager; J. H. Wilson, Resident Engineer; W. C. Brown, Assistant Resident Engineer; R. S. George, Mine Captain; M. S. E. Archibald, Mine Captain; E. H. Wells, Shift Boss; T. Evans, Chief Assayer; J. B. Moseley, Compound Manager, Eastern Section; R. A. Planck, Hospital Superintendent, Eastern Section; C. R. Trevaskis, Shift Boss.

Second row (left to right): A. W. Thompson, Shift Boss; J. H. Folster, Assistant Accountant; F. H. Vice, Assistant Native Timekeeper; W. A. Bridle, Engineer's Clerk; A. V. Watkinson, Mine Captain's Clerk; H. Wood, Assistant Assayer; W. Beattie, Outside Foreman Fitter; W. R. Moore, Foreman Mason; W. O. F. Anderson, Draughtsman; P. Morcom, Foreman Carpenter; L. M. Arrowsmith, Shift Boss; F. C. B. Schoults, Assistant Hospital Superintendent, Eastern Section; J. Farrow, Foreman Timberman, Western Section; T. Farrow, Foreman Timberman, Eastern Section; L. H. MacCallum, Draughtsman; J. C. Holland, Assistant Assayer; W. Philip, Crusher Station Foreman; J. Sharp, Mill Shift Boss; E. H. Emerton, Assistant Timekeeper.

Third row (left to right): F. A. Bawden, Head Sampler; K. L. Wilkinson, Assistant Native Timekeeper; W. A. Liggett, Mill Shift Boss; P. Wilson, Mill Foreman; W. H. Angus, Mill Shift Boss; H. H. J. Scott, Assistant Storekeeper; E. J. Birrell, Statistician; A. G. L. Clarke, Assistant Storekeeper; D. A. Stupart, Assistant Storekeeper; G. H. Seldon, Foreman Rock Drill Fitter; H. Leach, Cyanide Shift Boss; W. Jooste, Change House Attendant; C. P. Brown, Assistant Sampler; L'P. Oldreive, Paymaster and Head Timekeeper; C. O. Trevaskis, Assistant Sampler; D. Morkel, Assistant Native Timekeeper.

Fourth row (left to right): W. H. Brunton, Assistant Storekeeper; S. F. Kirkman, Assistant Sampler; W. D. Kirkman, Assistant Sampler; F. S. Deeks, Assistant Storekeeper; D. W. McDonald, Assistant Surveyor, Western Section; S. Else, Assistant Native Timekeeper; R. H. Smith, Compound Manager, Western Section; T. C. Harmer, Mine Captain's Clerk; S. K. G. Mackenzie, Shift Boss; J. L. White, Reduction Works Clerk; N. J. J. Britz, Shift Boss; C. van Breda, Shift Boss; T. D. Jenkins, Head Native Timekeeper.

Fifth row (left to right): C. C. Jackson, White Timekeeper; V. W. Kilroe, Assistant Timekeeper; F. J. Schimper, Head Surveyor, Western Section; R. A. Dold, Head Surveyor, Eastern Section; C. Kernick, Assistant Sampler; G. N. Carroll, Shift Boss; J. Johnson, Shift Boss; C. W. Courtenay, Shift Boss; E. S. Marshall, Shift Boss; A. S. Webb, Assistant Compound Manager, Western Section; W. R. Wallace, Underground Timekeeper; R. Biggs, Assistant Compound Manager, Eastern Section; S. H. Johns, Assistant Compound Manager, Eastern Section; P. G. Mannings, Assistant Sampler.

Olliver, Photo.

CONCENTRATION OF DIAMONDIFEROUS GROUND AS APPLIED AT DE BEERS.

[By JAMES STEWART.][*]

In presenting this paper on the concentration of diamondiferous ground as applied to the works of the De Beers Consolidated Mines, Ltd., I hope I may be pardoned for digressing a little in order to bring forward some of the earliest known methods of concentration. Diamonds had been known for many centuries before the Christian era. We are told by the Hebrew writers that among the many precious stones worn on the breast-plates of the high priests were to be found diamonds. They have been known and mined for among the gravel beds of India for many centuries, even up to the present day. The Indian methods were very much like those of the early Vaal River diggers, simply shovelling out the gravel, washing away the clay, and afterwards searching the gravel for the diamonds. According to Mr. Gardner F. Williams' book, "The Diamond Mines of South Africa," the Brazilian diamond fields were made known to the Portuguese in the year 1728. The author gives a very good description of the methods of concentration by those early diggers. Gangs of slaves were put on to remove the diamond-bearing alluvial deposits from the river beds and ravines, and these deposits were piled in heaps to await the rainy season. Shallow pits were sunk in the sand along the brink of the streams. The bottom of these pits sloped so that the dashing of water on the gravel heaps would wash away the clay and lighter stones. The concentrate was again washed in a batea, or wooden dish with a depression in the centre. By dexterous shaking and whirling motions of the batea filled with water, the lighter gravel was carried to the rim and washed or scraped away, much in the same way as a gold prospector washes a pan of dirt. The diamonds were afterwards picked by hand from the remaining pebbles. Another method employed by the early Brazilian diggers was a sloping table, which was shaken by a row of slaves on either side, and over which the gravel and stream of clear water were passed, the keen eyes of the slaves detected the diamonds as they rolled down the table. If any of them were fortunate enough to find an exceptionally large diamond they were given their liberty—surely an incentive for them to be keen in their search for the precious stone. In the early days of the Vaal River diggings very little advance was shown in the method of concentration employed by the Brazilian digger. The gravel was simply washed or sifted through hand sieves, or through a rocking cradle, which was fitted with two or more portable sieves one above the other, having different sizes of mesh, the coarser being uppermost, the gravel thus being graded by passing down from one sieve to the other. As the cradle was rocked a stream of water was poured over the gravel to clean it and wash the sand through the bottom sieve. The sieves were then removed and the contents sorted over in small quantities by means of a scraper, which consisted of a piece of old hoop iron or the like. Shortly after the discovery of the dry mines or pipes an advance in the method of concentrating the diamond-bearing ground may be said to have commenced, although it was some considerable time before any real progress was made. In opening up the craters of the Kimberley district no water was available for washing the ground; it was simply broken up, sieved by hand, to separate the sand and smaller sizes, which were discarded, and the remainder sorted by hand. It was seldom that diamonds smaller than one or three-quarters of a carat were looked for. From time to time improvements were made in the method of screening. The Bebe sieve, or Baby as it was commonly called, was introduced by an American named Bebe, and may still be seen in use on the River Diggings. It consisted of a long sieve suspended between upright posts, the ground being fed at the head end. It was swung backwards and forwards with a jerking motion, the screened gravel being delivered over the tail end on to the sorting table. Among the first concentrating machines used was a long concave trough about 2 feet wide, having riffles forming two or three compartments in the length of the trough. The ground was fed from a feed hopped at the head end. The trough had a slight fall, and was rocked by hand, the ground being carried forward by a stream of water. The heavier deposit and diamonds gravitated and were caught by the riffles, the concentrate being removed periodically and sorted in the usual way. This machine did not survive long, because the heavy deposits, having a greater specific gravity than the diamond, banked against the riffles, and many of the diamonds were carried over. These methods of the alluvial or placer gold miner were not very successful. About 1874 or 1875 the foundation of the present rotary machine may be said to have been laid by the introduction of a small circular trough or pan having a shaft in the centre, to which were attached radial arms fitted with iron teeth, which stirred the ground and water, kept it loose in a thin puddle, and thus caused the diamonds and heavy concentrate to fall to the bottom, the tailings being discharged over the inner rim. These machines have been improved upon and enlarged, the standard pan being now 14 feet in diameter and having 10 radial arms to which the teeth are fixed. These arms are placed so as to form a spiral starting from the inner circle of the pan to the outer rim or periphery of the pan; they make five revolutions in completing the spiral. The teeth are also set at an angle to the radial line of the pan, so that in revolving they are forcing the diamonds and concentrate, as they gravitate to the outer rim of the pan, while the lighter gravel and sand rise and flow over a tailings gate set in the inner circle of the pan. The teeth are usually set about ¼in. above the bottom of the pan, and the speed of the arms is usually about eight revolutions per minute. The whole contents of the pan are emptied once every week. The concentrates are extracted at intervals during the course of the day through a small aperture in the bottom of the pan near the outer rim and sent to the pulsator for further concentration. The concentration by the rotary machine amounts to an average of 1·32 per cent. of the ground worked. For the efficient working of the rotary machine a great deal depends upon the consistency of the puddle or muddy state of the water; if too thick the density of the water will tend to float diamonds out of the pan. In my opinion it is still a debatable point as to what is the best consistency of the puddle used in washing. Some years ago Mr. Gardner F. Williams, the late general manager of the De Beers Company, in order to arrive at something definite with regard to the consistency of puddle, caused some tests to be made. The method adopted was that of taking the tailings direct from one pan. These tailings were screened through a cylinder covered with 1/16in. perforated steel, round holes, in order to get rid of the water and fine sand, the remainder being treated over a pulsator machine. Records were kept of the amount of heavy concentrates and diamonds found. Daily tests were made, and the puddle gradually thinned down for each test, and it was then found that very thin puddle gave the best results. For the purpose of this paper, and in order to try and throw some further light on this point, I procured a bottle of muddy water of the consistency used at one of our machines in order to test the density of the water, or to take the specific gravity of a diamond in the water as used in the machine. The specific gravity of a diamond in clear water is 3·54, in puddle 2·83, a difference of ·72. These tests were made by Mr. Sutton. I know that the idea of density in the puddle is to make the gravel more buoyant and the lighter matter more easily forced over the tailings gate, but at the same time, having reduced the apparent specific gravity of the diamond by the increased density of the puddle, is it not unreasonable to think that some of the smaller diamonds and cleavages will be more easily floated over? For a number of years no further reduction of the ground was made beyond what the rotary machines were considered capable of doing. After the day's work the contents of the washing pans were emptied into tanks and securely locked, to be further treated the following morning by being washed through the rocking cradle, as already described. But a little advance had been made by hand gravitating the clean gravel from the cradle. A small quantity of gravel was put into a hand sieve with small mesh, and by a peculiar whirling and jigging motion the diamonds were gravitated, the sieve with its contents turned smartly over, when most of the diamonds were found on the surface near the centre of the upturned gravel. The gravel was then sorted by hand. With the introduction of the pulsator machines the concentrates from the rotary machines were further concentrated. The first pulsators used by the old De Beers Company, introduced in 1886, were of the Collum type. These were used for a number of years, and were constructed with four sieves concentrating four different sizes, viz., ⅛in., +⅛in.—3-16in., +3-16in.—¼in., and +¼in.—⅜in. For some years no further concentration was made of sizes over —⅜in. These were simply delivered from the end of the screening cylinder to a table and hand sorter. After a time I added another jig sieve and plunger which took the +⅜in.—⅝in. size, and finally all sizes were jigged up to —1¼in., the hutch products being sorted by hand. In the Collum jig two plungers are placed between each pair of sieves, one behind the other, operated by means of a rocker with plungers attached and driven by connecting rod and adjustable eccentric. The advantage is economy of space by sacrifice of plunger area. The disadvantage is an unequal pulsion of the sieves, owing to the hydraulic water in the plunger compartments being forced through a hole about 9in. square, thus giving a much stronger pulsion on the part of the sieve nearest the hole. The concentrate is gravitated through the bed of the sieve into the hutch of the machine. The bedding formerly used on the jig screens was lead and iron shot, which I consider too heavy. I discarded it some years ago, and substituted heavy gravel from our own concentrates. This I consider a better and safer bed than spherical balls—which are too uniform in shape—and is nearer the specific gravity of the diamond. The specific gravity of a diamond is 3·54. The specific gravity of the gravel bedding ranges from 3·5 to 4·7, and should be graded to such a size that it will lie on the mesh of the jig sieve without clogging the screen. The screen should be large enough to allow the concentrate to fall through without clogging the sieve.

(To be continued.)

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[*] Paper read before the Kimberley Branch of the S.A.I. of E.

RELATION OF GEOLOGY TO MINING.*—I.

A Review of the Debt Mining on the Rand and Elsewhere Owes to Geology.

[By F. H. HATCH.]

Geology was founded to a large extent on the observations of the miner. The primary geological conceptions, such as outcrop, strike, dip, hanging-wall, and footwall, together with a wealth of mineralogical and petrological detail, were furnished by the work of the early metal miner; while the close study of the bedding relations of the coal-seams which their profitable extraction demanded, formed the basis of modern stratigraphy. To-day the positions are reversed: mining is in debt to geology. Thus, by the application of geological principles, valuable seams and lodes, even when disturbed by igneous intrusions or dislocated by faulting, are traced far beyond their first-known outcrops, and facts bearing on their downward extension are scientifically interpreted; while detailed geological surveys of mining districts are of the greatest service to prospectors, and sometimes lead to entirely new discoveries. To-day, on the great iron and copper mines of the United States, not only are geologists retained to study the deposits, but the exploratory work is often committed to their care. By means of a system of routine work, successfully organised on some of these mines, veins, and ore-shoots are correlated from level to level; raises, crosscuts, and pump-stations are located in the positions most suitable to geological conditions; and ore-bodies lost in faulted country are recovered, the fault displacement being determined quantitatively and allowed for in subsequent development work on lower levels.

Scientific instances of the successful application of geological knowledge to mining work can, of course, be given in abundance; but a few must suffice for the present purpose.

In this country the proving of the underground extension of the coalfields beneath the younger rocks surrounding them is of paramount importance to its industrial welfare. One of the first pieces of work in this direction resulted from the admirable mapping of the Midland coalfield by Beete Jukes, a distinguished member of the Geological Survey of England and Wales. The entire correctness of his theories was demonstrated by Henry Johnson in a deep sinking at Sandwell Park, when the first definite proof was furnished of the prolongation of the South Staffordshire coalfield to the east under the fringe of overlying red rocks.

Similarly the discovery of a buried coalfield in the south-east of England was the direct result of a piece of pure scientific deduction. Godwin-Austen argued that the tectonic folds in the Palæozoic floor, by which the existence of coal-basins are determined, would be traceable even when covered by a great thickness of newer rocks, because a line of disturbance, whether of faulting or folding, when once established, tends to be the locus of subsequent movement and thus to set its mark on the newer strata. The correctness of this tectonic principle was demonstrated by the successful borings carried out in the neighbourhood of Dover—first by Sir Edward Watkin and later by the Burr companies under the scientific advice of Professor W. Boyd Dawkins and other geologists. These borings showed that deeply-buried under Mesozoic and Tertiary strata is a coalfield, situated on the line connecting the seams worked in Northern France and Belgium with those of South Wales and Bristol; and it appears not improbable that other coal-areas might be found, if the underground geology of this line of country were systematically explored. A satisfactory feature of the discovery of buried coalfields in England is the large addition thereby made to our coal resources, as to which previous estimates had been rather pessimistic.

Another striking instance of the successful application of geology to mining is furnished by the tracing eastward and southward of the sub-outcrop or apex of the Rand banket formation under a cover of up to 1,200 feet of later uncomformable beds—namely, the Dolomite, with its basal Black Reef quartzites (Potchefstroom or Transvaal system) and the Beaufort or Ecca coal-measures (Karroo system). The investigations that led to this result were based on a geological survey of the country between Boksburg, the Springs and Heidelberg, the first results of which made it probable to me that the Van Ryn conglomerate, which disappears near the Springs beneath the Karroo coal-measures, and the Nigel conglomerate, emerging therefrom near Heidelberg, were geologically identical, although separated by a large area in which dolomite and coal-measures form the surface. As my work progressed, the supposition that the two outcrops with their opposed dips were respectively the northern and southern lips of a large but shallow synclinal basin became almost a certainty, and deep borings made in the intervening country confirmed in the end the correctness of the theory in the most satisfactory manner.

The successful outcome of these investigations added to the Witwatersrand goldfield an enormous area of mining ground in which the banket is not too deep for exploitation, should its average gold-content prove high enough to enable it to be profitably extracted—a consummation, of course, devoutly to be wished, but only demonstrable by shaft-sinking and development, since the assay results of borehole cores are no guide to average values. The deepest borehole (total depth 5,582 feet, and thus the second deepest of the whole Rand) of the series under my immediate supervision—namely, that put down on the boundary of the farms Grootvlei and Daggafontein, was practically on the axis of the syncline, and cut the "main reef" at a depth of 5,540 feet (or corrected for deviation, 4,880 feet). It passed through 1,140 feet of dolomite before entering the Witwatersrand formation, but gave a most instructive section of the latter, intersecting the Kimberley, Bird, Modderfontein, and Van Ryn or Main Reef series of conglomerates as well as their associated quartzites, slates, and sheets of amygdaloidal diabase. At the time of the sinking the whole of the core, about a mile in length, was carefully labelled and preserved on the property in a specially constructed core-house.

(To be continued.)

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*Abstract of Presidential address delivered before the Institution of Mining and Metallurgy.

AN ANALYSIS OF THE RAND'S OUTSTANDING FEATURES IN 1913

Authoritative Review and Explanation of the Salient Facts and Figures.

From the annual general review of the Rand that accompanies the annual report of the Consolidated Mines Selection each year, we take the following brief and valuable analysis of the chief features of Rand progress in 1913:—

A retrospect of the history of the whole of the Witwatersrand during 1913 shows how greatly the unrest prevailing amongst the white miners, culminating in a general strike during July, had hampered mining operations. The effect of the first strike had not passed away when towards the end of the year renewed agitation started. Operations on the producing mines of the Witwatersrand during 1913 resulted in a small advance in the tonnage crushed as compared with the previous year. Upon analysis, however, it is found that sorting is lower by 1·83 per cent., and the tonnage hoisted shows a decline of 461,722 tons. This is not surprising in view of the abnormal decrease in the native labour force resulting from the labour difficulties. Had it not been for the wider adoption of machine drilling, the reduction must have been more pronounced. A disadvantage connected with the increased machine drilling has been some lowering of the grade of ore. The actual tonnage crushed was 25,628,432 tons, which yielded gold to the value of £35,812,605. Comparing the results with those of the previous year, from a total tonnage crushed of nearly 150,000 more tons gold to the value of £1,369,000 less was won, while the yield per ton averaged 27s. 9d. as against 29s. in 1912. This reduction in grade may in part be attributed to the reduced sorting practised, and to the more extensive use of machine drills as already mentioned. Working costs at 17s. 11d. per ton show a decline of 9d.; reduced sorting accounts for about one-half of this saving. There is an increased efficiency shown by a greater production per unit of labour, and this may be regarded as a real gain. The improvement in costs is creditable, in view of the extraordinary expenditure in connection with the strike, and the additional costs incurred on account of phthisis compensation and insurance. Notwithstanding the reduction of working costs, the aggregate profits for 1913 were about £500,000 less than for the previous year, for reasons already explained. The profits during 1913 totalled £12,189,105, as against £12,678,095 during 1912, these figures being equivalent to 9s. 6d. and 10s. per ton respectively. Distributions of dividends amounting to £8,193,994 show an improvement of £241,000, as compared with those of 1912. The apparent anomaly of an increased distribution in spite of a considerably decreased working profit is explained partly by the completion or curtailment of work calling for extraordinary expenditure, partly by the financial adjustments of two mining companies, and, finally, by the entry to the list of dividend-payers of the Van Ryn Deep. The distributed and undistributed profits per ton for the industry as a whole as compared with the three preceding years are tabulated below:

	Distributed Profits per ton milled.		Undistributed Profit per ton milled.	
	s.	d.	s.	d.
1910	8	1	2	5
1911	6	6	3	1
1912	6	3	3	9
1913	6	5	3	1

The following tabulation concerning the producing mines will be of interest:—

	December, 1912.	December, 1913.		
Number of stamps dropping	9.440	9.170	Decrease	270
Number of tube mills working	277	278	Increase	1
Average number of rock drills working	5.530	5,645	Increase	115
Tons crushed per stamp per day	8·66	8·74	Increase	0·08
Tons hoisted per boy per month	13·12	14·98	Increase	1·86

The relative position as to stamps and tube mills again shows a tendency towards extension of the latter as an auxiliary crushing machine. The further use of rock drills in stoping is also noticeable, but the increase in number, as given in the tabulation, does not reflect sufficiently the growth of this practice, owing to the great disparity in the labour force at the two months mentioned. During December, 1912, there were 188,611 natives employed as against only 148,102 during last December, and the number of rock drills working per 1.000 natives employed has increased by 31 per cent., viz., from 29 to 38. The greater tonnage hoisted per boy per month is mainly the result of this expansion in the use of rock drills. At the end of the year four companies, all in the Far East Rand, were either in the development or shaft sinking stage, and had not reached production. The shafts of the Springs Mines and the two southern shafts of the Government Areas intersected the reef during the year. Shaft sinking continues in the Daggafontein, and the reef is expected to be cut towards the end of the present year. Our usual statistical table relating to developing properties follows:—

		Dec., 1912.	Dec., 1913.		
Number of mines developing		7	4	Dec.	3
Main Shaft Sinking	feet	895	194	Dec.	701
Main drives and crosscuts	feet	3,144	3.833	Inc.	689
Other development	feet	1.910	1,178	Dec.	732
Average number of rock drills working		104	169	Inc.	65
Tons of rock hoisted		45,321	36,578	Dec.	8,743

Ore Treatment.—There is little of interest to report in connection with ore treatment. Vacuum filtration plants for the treatment of slime have been installed by three companies during the year.

Mechanical Appliances.—Considerable activity has been shown by the designers of rock drills, in consequence of the necessity of combating the ever recurring native labour shortage by the substitution of mechanical appliances. The type of machine now attracting most attention is the small hammer drill using hollow steel through which water under pressure is introduced. A large number of tests have been made on various mines with distinct success. A great deal of experimental work has also been done in connection with detachable bits, and a certain amount of success has been met with. Mechanical drill sharpeners have been installed at many mines, especially since the last strike, and, in connection with the transport of ore, mechanical shaking chutes have been introduced for use in stopes.

Power and Air Supply.—The supply of electric power and air has been more satisfactory.

Native Labour.—Shortage of native labour has been more pronounced than usual, and was the outstanding complaint during the latter half of a most trying year. During the first six months the number of coloured employees averaged about 201,000 monthly. In December this number had decreased by 53,000, and the average strength on the books of the companies during the last six months was only 78 per cent. of that during the previous half year.

Accident to Mine Manager.

At a late hour on Monday afternoon, Mr. A. Tippett, an underground manager on the Randfontein Central, met with a serious accident at the Porges Mine. He was, it appears, inspecting some waste rock used for filling an old stope. This rock had got jammed, and attempts were being made to prize it free, when suddenly the mass started moving. Mr. Tippett was caught in a veritable avalanche and carried a distance of 300 feet down the stope. He was extricated from his position and taken to the Robinson Hospital, where it was found that his injuries were serious

Springs Mines.

The development work on the Springs Mines for the quarter shows the following details for the north and south shafts: Total footage, 4,167 feet; footage on reef, 2,073 feet; footage sampled, 2,510 feet; reef width, 14·46 inches; assay value, 13·47 dwts. Owing to some of the development being in the nature of drives and haulage-ways below the reef, only a portion of the footage has been sampled, and that partly by means of diamond drilling. The Rand Water Board took 85,840.000 gallons of water during the quarter. The ordinary general meeting of shareholders will be held in the board room, Corner House, on Tuesday, May 26, at 10.30 a.m

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How to Exploit the Outside Districts.

To the Editor, *South African Mining Journal.*

Sir,—As a prospector of many years' experience, I should like to place my views before you as regards alluvial and small reef mining in the outside districts of the Transvaal. I consider all alluvial deposits should be thrown open to the public, as in Australia and elsewhere, with a working clause on the principal of one claim to each miner, to be worked or abandoned after ten days of pegging, and in the case of alluvial deposits no transfer of claims to be acknowledged. This I would like to see carried out, as by so doing you would put a stop to this syndicate business, which invariably ends by locking up huge tracts of good country against the genuine miners. There are immense areas of gold-bearing gravels around the headwaters of the Sabie and Blyde rivers at present locked up by capital, enough to take the greater part of the unemployed off the reef; and reef mining would surely follow in the wake of the alluvial digger. It may be of interest to take and follow the procedure of syndicates at Mount Anderson, Lydenburg, lately. Here you have a field with very good possibilities for the digger and the small man, but what do we find? Huge blocks of claims being pegged for speculative purposes to the detriment of the digger. One cannot call it a field for huge capital, it merely being leaders and shed or alluvial gold and ought to be worked by individual diggers, whereas it will, I presume, be locked up as many others of such like nature. On the other hand, presumably, they have pegged out on reef claim licences at 5s. each, whereas an alluvial claim licence costs £1 per month for the digger who is working his claim. So long as this is allowed so long will prospecting languish. Open the country to the prospector, unlock those areas held for speculative moves, make a compulsory working clause, in case of alluvial deposits, "one man one claim," with no transfer rights; erect customs mills in likely districts, which will enable the miner to develop his claims as he goes along; and by so doing you will start a new era in mining in so far as it affects the outside districts and open up fresh fields for the commercial and farming community in general. The deep levels and such are unique and present conditions are bound to remain with us owing to the huge call on capital they involve, but let us get this country open, as there is no getting away from the fact that it is a mining country ready made. Why do we all clamour after the agricultural side of it when most people have come to look upon farming out here with anything but good grace. Look at the huge loans within the past few years doled out to different farming ventures, and ask yourselves how it would have been if the same amount of support had been given to the small miners, as to whether the country would not have been in a sounder position to-day than it is under the great make-believe of South Africa ever becoming the farm of the world. I would say, minerals we have in abundance; agriculture, to say the least, is risky. Let us work our wealth and so create industries, not the cart before the horse.—Yours, etc.,

F. MATTHEWS.

Bethal Station.

Another Prospector's Views.

To the Editor, *South African Mining Journal.*

Sir,—With great interest I am following replies to your query: What is wrong with South African Mining? I regret to say that so far no reply appeared in your columns to satisfy my opinion. I am a prospector with several years' experience in the field, enough geological knowledge for guidance to prospecting, and can easily recognise several minerals in different forms as they appear. (Of course my knowledge is limited on the last item.) Nevertheless I can recognise a valuable mineral by first appearance or the usual methods. I am satisfied that the fossicker, or prospector, as he is generally known, should be allowed a larger field for his enterprise, thus:—(1) The country right through to be proclaimed open for prospecting under safeguards to owner, houses, gardens, etc. (2) Rewards to discoverers to be more adequate, instead of, as at present, left to the discretion of an Inspector of Mines, who may advise the grant as he thinks. (3) Discoverer should mean the first discoverer of a mineral deposit on a certain farm, district, etc.; not the one who, after finding out another man's discovery, (who for various reasons may be unable to de extensive work to prove his ground) may be able to afford to put down a deeper pit and so outdo the original discoverer, as at present. (4) Licence monies for at least four years should be abolished on unproved mineral areas, providing the holder of claims, etc., would do a certain amount of work to prove the value of his ground, failing which the claims should lapse. Licence money should only be charged when transfer of the claims for mining purposes has been accomplished. (5) If the discoverer's claims, etc., prove of sufficient value to the satisfaction of a governing body on that matter, money should be advanced by the Government under proper control for further development, etc., the Government taking control of the property until all capital advanced is repaid. Trusting this will find a space in your valuable columns.—Yours, etc.,

SAM LAURENCE,
Ex-Prospector.

Krugersdorp, 14th April, 1914.

The Shortcomings of the Prospector

To the Editor, *South African Mining Journal.*

Sir,—Your various correspondents have a good deal to say, and in your last issue of the 18th inst. "A One-time Mug" has given us a dissertation, which, if it shows nothing else, is pretty emphatic in showing his *nomme-de-guerre* as being very appropriate, as the Americans say. By some fell chance, or on the principle of like mating with like, he seems to have met his desserts, but this is foreign to the question. The old-time fossicker, like the old-time fighting sailing ships, has gone; the victories they won have been forgotten, like the very wonderful results obtained by the old-time fossicker, and now the modern gilded expert has taken his place. I should place this genera as Fossicker Primary, the Petrologist, Stratigraphist, Mineralogist and the Assayist as secondary; but since these gentlemen have come to the front, we hear of no more wonderful discoveries, nor do we hear they have in any way done better than these old-time fossickers, except perhaps in so much as their fees for a day's work on a prospect are as much as the wages of the old-time fossicker for six months' hard, crude and disappointing work, with very little tools, material and transport. Fancy a fossicker with a motor car. The promoter always could have visited his fossicker and cried off at any time, but now with the gentleman of scientific denominations as above, who give such awfully scientific names to simple things, men of the "one-time mug" class are as completely humbugged as ever they were. Nor is this all; De Beers and the Rand were condemned by these fancy expert gents. I claim to have as fair a general education as most men. Amongst other things, I have gone in for mineralogy, but the beautiful scientific language amuses and astounds one. The latest scientific book on diamonds I have endeavoured to read has, on page 114, these: Pseudomorphic, after olivine; Phlogopite: Pyrope; Micaceous ground mass; Augite; Apatite; Perowskite; Calcite; Serpentine; Pleochroic chlorite; Potassium; Porphyritic elements of olivine; Ilmenite; Diopside; Holocrystaline; Megascopic olivines; Bastite; Zonary structure; Ilmenite phenocrysts; Lampisphyric, and so on. I know it is all right, but I cannot understand it, and I venture to state that, including the author, there are not ten men in South Africa who will understand this work as it ought to be; to the general public it is Dead Sea fruit. These questions now naturally arise: Would or could this author have gone prospecting? Without the fossicker, could he have written the book? Could "A One-time Mug" afford to employ such an erudite scientific man as the author? Then could he have understood him? The question as to the merits or demerits of the "old-time fossicker" and the "scientific expert" is a side issue altogether. The real question is the necessity of the "One time Mug" man. I gather from his letter he is of the "promoter" class; here is where the shoe pinches. "A One-time Mug" and "An Old-time Fossicker" are both bent on the same game, making money and spending it, according to their individual whims. The fossicker brings a prospect; the scientific gent. reports; the promoter either tries to swindle him straight off, but, if that cannot be done, he buys on shares and/or cash, a law is passed that the vendor (fossicker) cannot sell his shares until a period has elapsed. The promoter, promotes, when and how it suits himself. Naturally the fossicker resents and plays the same game as the promoter; can the latter squeal if he is hit? The promoter now having got the property, sets to work and floats, or tries to, at an enormous over-capitalisation; the public have had some, much too much, and they don't want any more. Meanwhile there is no use for the fossicker, the one-time mug, or the promoter. These latter are acquiring all the knowledge the old-time fossicker brings them, they inspect, and they file the knowledge away, for they can afford to wait their time, and when the demand improves, perhaps in years, they know exactly where to go and get the prospect for nothing. The law of allowing huge corporations to hold the mineral rights over the country is a disgrace to the people who allow such a law to remain in force. The corporations should be made to work them within a specified period, say three years, or they, *ipso facto*, lapse to the owner of the surface rights, with the over-lord of the Government. This country is a mining and highly-mineralised one; we live by mining, yet our present poverty and embarassment is simply caused by the existing mining law.—Yours, etc.,

R. W. HODGES.

Johannesburg, 21st April.

What's Wrong with South African Mining?

To the Editor, *South African Mining Journal.*

Sir,—I am pleased that "Another Fossicker" has replied to my letter which appeared in the Journal on the 4th inst. by his of the 11th; it gives me a chance to hit back, although I expected that "a well-known consulting engineer" would give me the word with the bark on it. It seems that he refuses battle. Consulting engineer used in his criticism of prospectors the words "average prospector"; what does he mean? What is an "average prospector"? I ask him to explain. If consulting engineer asked me the meaning of the words "average consulting engineer," I could not do so, although I made use of the expression. But I should say that an average prospector is much the same as an average mechanic, miner, sailor or navvy, that is a jack of all trades and master of none. And I agree with "Another Fossicker" that a prospector answering this description is not of any use, excepting to discover "jewellers' shops" which to a certain extent in South Africa have all been found, although there are still some rich outcrops once discovered and lost again—through the finders dying or leaving—awaiting another luck man "barking his shins" over the lode as "Another Fossicker" puts it, and he need not be a consulting engineer or Royal School of Mines man to do that. "Another Fossicker" says that "there is rather a hostile tone" running through my letter. I fail to see it. It is simple plain truth, and my defence of those old pioneers (of whom there are very few left, I'm sorry to say) who made the important mining discoveries in the early days, and through whose efforts this great industry has arisen. Can "Another Fossicker" mention one successful British Colony (with the exception of Eastern Canada) that does not owe its present population and wealth to the prospector who "humped bluey" and first pioneered the countries for minerals? He cannot. *After* the free gold prospector came the men who have "a sound knowledge of geology, mineralogy, and the determination of minerals," as "Another Fossicker" has it, referring to the only two men he has met whom he judged were competent prospectora. And you can bet your life "Another Fossicker" that the "sixth sense" to find minerals is as indispensable to the trained man as it was and is to the successful prospector, who does not pretend to a Royal School of Mines education. For without that sixth sense not all that high-class training will guide him to pay ore. "Another Fossicker" says: "In the course of my wanderings I have met altogether about thirty so-called prospectors." I wonder where he met them, for it strikes me that he met thirty beer sparrers and blowers. If he will look up my letter of the 4th inst., he will see that I say "the true prospector is born, not made," and he has no need to blow. And if "Another Fossicker" wants to know I can mention more than thirty "true prospectors" who have "a sound knowledge of geology, mineralogy and the determination of minerals, and capable of sampling a prospect or mine in a proper manner," and many of whom assay fairly as well. So it's evident that "Another Fossicker" has been looking in the wrong places for the true prospectors. "Another Fossicker" says "he writes in no hostile spirit." Why, his whole letter bristles with hostility; for among other nasty things he says: "Fossicker and his friends should realise now that they have a better chance of getting to heaven than of getting money from the public, although there are still plenty of fools." (Was "Another Fossicker" one of the mugs?) What does he mean by that statement? He is not only hostile but downright insulting, for he is classing me as a beer sparrer and swindler along with the rest of his so-called prospectors who are now shunting trucks, selling beer and barbering. Let me tell him that my prospecting was done in the usual strenuous manner adopted by a true prospector, who I'm sure "Another Fossicker" cannot blame if he is sent to an unmineralised country and has not found; that's not the prospector's fault, but I'm thankful to say that I've been very successful, although most of my prospecting has been done at my own expense. Cast around "Another Fossicker" and you'll find plenty of true prospectors who can fill the bill even to your critical satisfaction, but you won't find them blowing and sparring for beer; you'll have to seek elsewhere. I'm sure I don't blame those two competent men whom "Another Fossicker" knows, for taking a job on the mines; for a more thankless billet is not to be found than that of the prospector. And the true prospector, as "Another Fossicker" says, is ranked with the beer sparrers by the ignorant public all on account of incompetent men being sent to work at a trade they are entirely unsuited for; have been sent probably by "syndicate mongers," but more often because they have friends in high places. For really some consulting engineers I have heard of are greatly to blame for sending out the type of men they do to prospect, and it's simply wasting the public's money to keep, as I've known it to be done, perfectly incompetent men in the position of prospectors, not for weeks or months, but years, because they or their relations have been in or are in the employ of the particular group to which the consulting engineer belongs. It gives them some of the soft billets "which hang on the mining industry." And I tell you, sir, that for an outsider, that is a man who has not got the strong arm of favouritism behind him, no matter how competent he may be as a first-class prospector, in most cases there's no chance for him getting work by applying for it. I've been told that or its equivalent by more than one consulting engineer. It's monstrous. Then you enquire "What's wrong with South African mining?" That's one reason. Is there any mining industry other than gold where such waste occurs? It seems to me that because it's gold mining it does not matter what money is spent uselessly; there's some glamour about gold mining whereby it's superfluous to have brains for one of the most important positions, and upon whom the life of the industry depends that of the *true* prospector; for, sir, if he drops out of the running or he is not encouraged, how will it continue? It must die; for it is not everyone who is a prospector, as "Another Fossicker" very forcibly if personally points out. In nearly all cases there's no chance for the prospector who knows his business unless he's backed by the men in high places, his knowledge and experience go for nothing. "Another Fossicker" states that he has "seen middle-aged prospectors studying at technical schools in the winter months." Now that's just as it should be, but where are the technical schools in this country for the prospector and miner to study at? I presume that their studies were State-aided and thus free. That's where our Governments are to blame. Do they provide or encourage education such as would be suitable to those men, even if it is given for nothing? Oh no! The man who by his strenuous work keeps the mining industry afloat must educate himself or pay for it, and I ask how many prospectors can do that? The sagacious Governments of Australasia and the United States of America have long ago seen, that to foster the mining industry they must educate the prospector and miner, the first of whom they rely upon to find the minerals which is his calling in life, his fate, and their salvation as mineral-producing countries; the second to mine the ore when found. The Australasian Governments are so much alive to the necessity of keeping the prospector and miner posted in up-to-date knowledge, that they send out professors to lecture in the mining districts, perform experiments in assaying and chemical analysis, and teach the miner the best way to work, and all at no cost to the men. Do any of the South African Governments do that? No, but they'll squander millions on the Agricultural Departments, because in their eyes the farmer comes first and the mining industry last; although the latter has given South Africa its prosperity, and agriculture never will; it is a stock-raising but not an agricultural country. The Transvaal Mining Department is really too funny. The Geological Department offers to determine minerals free of cost; but they make one pay through the nose to get assays done. The Department is humorous, for it states in its notice of assaying costs that they are made low in price to help those men who cannot afford to pay ordinary assayers' high charges. Why, the list of assay charges are higher in some cases than they would cost if done by a working assayer, that is a private man. And were it not for kind mine managers and assayers who help the prospector in making assays for him at the lowest cost possible, or often gratis, what the poor prospector would do to get his assays done I don't know; the Government won't help the men who help them to keep the ship of State afloat. The Government does not help the mining industry at all; it is pay, pay, pay; everything is run like a big shop where a profit *must* be made. Then, sir, you ask, "What is wrong with South African mining?" I've just given you other reasons. Why should not Government help? Why do they not send out men properly supervised to find mines at the cost of the Government to be a lien on the mine or district when found, as other countries do? Why must it be left to private enterprise to develop the minerals of this country? The Transvaal Consolidated Lands are spending huge sums yearly to find payable mines, because it pays to do so. One good mine will pay for a dozen or more unpayable ones, as the T.C.L. have found out. The T.C.L. are great explorers, and may they amass great wealth; they deserve it. Other mining houses do something in the exploration line, but not to the extent of the T.C.L. Take mining licences; before a digger may sell gold he must (by law) take out a £1 licence—even if he's only got an ounce; and it must be sold through a bank or someone who pays the preposterously high gold buying licence. And when all the banking charges are paid, how much has that poor digger left out of the value of his ounce? The other licences, except the prospecting licence, are low enough, but the digger's licence is extortion. This is a relic of the pre war days. Take surveys, for instance. What poor digger or prospector can pay the high fees in vogue, as all surveyor's charges are here. Fortunately, again, we have the kind man who helps the poor man sometimes. But this is not right. Government ought to furnish surveys free, as is done elsewhere. If one wants a chart of any section of the country one must pay 5s. for it at the Government Printing Office. Five shillings forsooth for a sheet of paper which is often quite unreliable, as not all the country is surveyed. First the public pay for the compiling of the sheet, then they must pay again for the chart for which they have already paid. But a profit *must* be made, so that money may be squandered on the Civil Service or in any way the Government chooses; but not in aid of the mining industry, oh no, that would be wasting it. It is provided in the Gold Law that rewards shall be paid for new mineral discoveries should they prove valuable. Has a reward ever been paid, Mr. Editor? No, sir, and never will. It almost seems as though the Government want to stifle the mining industry. They don't send out the prospector to find, and if he does find on his own account all the reward he will get is the ground for which he must pay half-a-crown a claim as prospecting licence. How many prospectors can afford that sum monthly for say 12 claims If he takes out a prospecting permit he must work the area to the satisfaction of the Mining Commissioner; and if he fails to satisfy that official with the amount of work done no further licence will be granted. Again, I ask, considering the absurdly low pay a prospector generally gets if he works for another, how can he save enough if he is allowed to keep his job for a few months, to work for himself unaided; and how will the mining industry exist in the future? Sir, the South African mining industry is dying. Most of the wealth sent into South Africa has been spent, and is still being spent in the Rand; it is not the policy of the Government or some of the great houses to encourage the exploitation of other parts of the Union for minerals, as that would be spreading the money over too much ground. The cash *must* remain on the Rand, and the Rand can't live for ever. These are other reasons why South African mining has gone wrong. So, "Another Fossicker," I shall be glad to hear your views again, but try and avoid being nasty, and to discuss matters of public interest I shall always be glad to cross swords with you. And should you go to another country, as you say you propose doing, may you—strike it fat!—Yours, etc.,

FOSSICKER.

Barberton, April 21.

Rhodesian Section.

LATEST MINING NEWS.

Shamva Trial Crushings—The Antelope—Globe and Phoenix Developments—Results at the Gaika.

A telegram from Bulawayo, giving the results of the trial crushing in February at the Shamva Mines, has been published in London in mail week. This stated: "The quantity of ore treated was 18,078 tons, the average assay value being 4·02 dwts. The gold recovered amounted to 1,285 ozs. of fine gold, the average assay value of the sand residue being ·32 dwt. per ton, and the average assay value of the slime residue ·22 dwt. It is estimated that the absorption of gold by the plant so far in operation amounts to about 58 per cent. of the gold contents of the ore. It must be borne in mind that only one-half of the stamps were dropped down to February 16, whilst the remainder have been gradually coming into commission. The trial run is being continued this month."

* * * *

The report for the quarter ended December 31 in regard to operations on the Antelope Mine states that the ore reserves have declined from 157,923 tons, valued at 10·18 dwts., to 155,232 tons, worth 10·15 dwts. per ton. Practically all development was suspended during the period under review, and labour was chiefly concentrated on completing the stope drives and generally preparing the mine for milling.

* * * *

The following shows the developments on the Globe and Phœnix mine during the month of March, 1914:—14th level: Drive north from main shaft, prospecting, has advanced 49 feet. 14th level: Drive north on far north reef has advanced 19 feet; average width of reef, 16 inches; average value, 25 dwts. 15th level: East portion south drive on main reef has advanced 17 feet; average width of reef, 4 inches; average value, 19 dwts. 15th level: East portion south drive on hanging wall leader from main reef had advanced 20 feet; average width of reef, 8 inches; average value, 86 dwts. 15th level: East portion south drive footwall reef, No. 1 rise has advanced 14 feet; average width of reef, 5 inches; average value, 33 dwts. 20th level: Drive north on hanging wall leader has advanced 71 feet; average width of reef, 26 inches; average value, 134 dwts. 20th level: Drive south on hanging wall leader has advanced 46 feet; average width of reef, 23 inches; average value, 4 dwts. 21st level: Drive north from No. 2 winze has advanced 81 feet; average width of reef, 15 inches; average value, 1 dwt. Vertical shaft, total depth, 94 feet. Crosscutting for month, 65 feet. (Note.—The actual widths of the reefs, and the actual assay values are given, except where the width of the reef is below 30 inches. In these cases, as a minimum width of 30 inches of rock must be removed for stoping, the value is given as the average for the whole 30 inches width, e.g., if a 10 inch reef assayed 36 dwts. the average value over the stoping width of 30 inches would be 12 dwts., and would be so stated.)

* * * *

The last quarterly report, to 31st December, issued by the secretaries to the Gaika Gold Mining Company, Ltd., contains the following:—Ore reserves: Total tonnage previously developed, 74,695 tons, value 14·77 dwts.; total tonnage developed during quarter, 30,464 tons, value 14·46 dwts; total, 105,159 tons, value, 14·69 dwts.; less milled during quarter, 9,104 tons; total ore reserves on hand to date, 96,055 tons, value 14·46 dwts.; rubble reserve, 14,000 tons, value 3 dwts. The following are the results obtained from milling and cyaniding during the three months ended December 31, 1913:

	Days run.		Tons	Total yield.		Profit.
Month.	Stamps.	Auxiliaries.	crushed.	Fine ozs.	Value.	Estimated
October	28·75	Chilian 29·25	3,065	1,478·81	£6,281	£2,233
November	27·79	Chilian 28·41	3,214	1,525·81	6,412	2,496
December	26·25	Chilian 26·37	2,825	1,581·86	6,648	2,795
	82·79	84·03	9,104	4,586·49	£19,341	£7,524

Total working costs, £11,817 16s. 1d., equal to £1 5s. 11·54d. per ton milled; profit, estimated, £7,523 19s. 2d., equal to 16s. 6·34d. per ton milled; value bullion, estimated, £19,341 15s. 3d., equal to £2 2s. 5·88d. per ton milled; sundry revenue, rents, £16 5s. Capital expenditure during the quarter, £997 1s. 6d.

Rhodesian Budget.

In the Legislative Council last week, Mr. Newton introduced the Budget. The revenue for 1913-14 was £777,000, and the expenditure £820,000, plus £14,000 on native relief, making a total deficit of £57,000. There was a fairly uniform shortage under most headings, which was attributed to the setback in trade, the drought, the partial reaping of crops, and lack of support of the mining industry owing to European disturbances. A hopeful sign was the steady augmentation of the white population, the net increase being maintained at the rate of three thousand per annum. For 1914-15 the Treasurer estimated a revenue of £804,000 and an expenditure of £817,000, and proposed to make up the deficit by doubling the duty on brandy, which was expected to realise £9,000, and imposing an excise of 4d. a gallon on beer; also a small duty on imported beer, yielding altogether £4,300.

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Engineering Notes and News.

Draft Patents Bill.

Speaking at the School of Mines on Saturday night at a meeting of the Chemical, Metallurgical and Mining Society on the subject of the Union Patents Bill, Professor J. A. Wilkinson said that there should have been scientific representatives on the Commission which drafted the Patents Bill, whereas they were all legal men. He criticised the provision of sub-offices for patents in the smaller towns, and said that most patents would naturally come from a large industrial centre like Johannesburg. He urged that the assistance of an official from the Patents Office, London, should be requested by the Government, and stated that the Bill as it stood was a piece of class legislation in the sense that the reward of the patentee was regarded more than the benefit of the public. Money spent on sub-offices in the smaller centres would be money absolutely wasted. If reason instead of politics was to be the guide of those who were responsible for the legislation he thought it would be considered that Johannesburg should have its sub-office. There should be publication periodically of matters relating to patents, which should be distributed to the various public libraries. The Government of South Africa had not minded spending money upon agricultural journals, and if they could afford to do that they could afford to spend a little upon patent specifications. "I am informed," continued Professor Wilkinson, "that a new Bill is to go before Parliament shortly after the Easter recess, the Bill which we have been discussing having been put on the scrap heap." He thought that the matter was one of such importance that he proposed that a sub-committee of the Society should be formed with full power to deal with the matter and make representations to the Minister of Justice.

Mr. A. S. E. Ackermann will shortly read a paper before the Society of Engineers (Incorporated) on "The Utilisation of Solar Energy," embodying the results of his 48 trials of the Shuman plant for raising steam and generating power from the sun's heat. The plant tested has cost some £30,000, the investigations cover nearly four years, and though many experiments with sun power have been made during the last 50 years, this is the first paper of its kind. The meeting is to be held at the Institution of Electrical Engineers on Monday, April 6, at 7.30 p.m. In view of the satisfactory results obtained from the plant at Meadi, near Cairo, the Egyptian Government has placed an order with the makers for a similar but larger plant for irrigation work in the Sudan. The Cairo plant has an output of 50 b.h.p., and the heating surface covers an area of about 1 acre.—*Electrical Review.*

Delagoa's New Coaling Installation.

The new coaling installation at Delagoa Bay has been supplied by the McMyler Company, of Ohio. It will have a normal loading capacity of 400 tons per hour, but this can be increased if necessary to 600 tons. The structure, which is some 66 feet high, raises the coal trucks by means of a cradle up to the height required by the state of the tide, turns the truck on its side, and throws the coal into an apron ending in a telescopic tube, through which the coal descends steadily into the ship's hold so as to avoid breakage. This tube, which is always kept full, has a movable end worked by an electrical winch fixed on to the apron, which distributes the coal evenly in the hold, so that in addition to the time and labour saved by the process there is a considerable reduction in the trouble attendant on hand labour in trimming the coal. The Lourenco Marques coaling installation is suitable for any kind of truck, and can deal with either one large or two small trucks at the same time. Each cycle of operations, i.e., to draw the truck to the cradle, to raise it, to empty it, and to bring it down and take it out so that another truck can be dealt with, including the weighing of the truck when loaded and again after it has been emptied, will take about four minutes. For the purpose of weighing, two Howe scales are employed. The loaded trucks are brought to the first scale by an endless rope, which is constantly in motion and passes on the side of the lines of railway connected with the yards holding the loaded and empty trucks. These lines are joined by an automatic switch at a short distance from the plant. The loaded trucks are pushed along by a locomotive as far as the endless rope, to which each truck is hooked, and taken to the scale, and then are hoisted by the cradle. The empty trucks are drawn from the plant by the same endless rope, and after passing the automatic switch they go down a gradient as far as the other scale. After weighing there the endless rope again takes charge of them, and they go down another gradient into the empty truck yard. The installation is worked exclusively by electricity. Seven motors are used—two of 250 horse power for the winch hoisting the cradle and truck; one of 75 h.p. for the endless rope; one of 50 h.p. for driving the screws for the up-and-down motion of the horizontal girder to which the apron is attached; one of 50 h.p. for the winch which hoists the apron; one of 33 h.p. for the telescopic tube; and another of equal power for the winch that moves the steamer to and fro so as to bring each of the holds into position. These seven motors and the respective winches are worked by three men only, one being placed in a cabin at a height of 50 feet, one on the outside end of the apron, and the third on the quay level. Owing to the large amount of power required to work the plant, a Tudor storage battery of a capacity of 1,320 amperes in one hour has been installed. This battery, which takes the pick-loads, is supplemented by a "booster" and switchboard, which are installed at the Port Electrical Station. The plant has been put together by the Bottomley Engineering Company, of Johannesburg, under the guidance of Mr. Ransome, the engineer detailed by the McMyler Company to supervise the erection. The mechanical and electrical sections of the works have been officially supervised by Mr. J. Vaz Gomes, acting chief electrical engineer for the port.

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Modern scientific farming requires a tremendous amount of mechanical power for grinding, cutting, threshing, pumping, etc., and the value of electricity in this connection is being realised to a surprising extent in the United States of America at present, where manufacturers and others controlling electrical power stations are making it possible to use their power on farms. These manufacturers, etc., are offering all sorts of farm machines readily adapted for electric drive, and scarcely one of them is not effecting a large saving in time and a consequent reduction in the amount of labour, as most of the ordinary appliances require but one operator. Motors are used for all purposes by the farmers in America, such as pumping water, grinding feed, sawing wood, elevating grain into cribs and granaries, on cream separators, churns, washing machines, sewing machines, fans, and irons. Many of them have large tungsten lamps on poles in door, barn and feed yards, and without exception they appreciate these lights very highly. Now the following data supplied by Mr. D. R. Palmquist in the *Scientific American* of 29th November last, shows what it is actually costing the average farmer to equip his farm with electricity:—

Farm No. 1.—Cost of wiring house and barn, £17 10s.; cost of metres, £10 10s.; number of lights installed, 30; number of motors installed, 2; size of motors, 5 horse power and the ½ horse power. Farm machines operated by above motors: Feed grinder, grain elevator, cream separator, churn and wash machine.

Farm No. 2.—Cost of wiring house and barn, £25 15s.; cost of metres, £10 10s.; number of lights installed, 40; number of motors installed, 2; size of motors, 3 horse power and ½ horse power. Farm machines operated by motors: Grain elevator, feed grinder, cream separator, churn, wash machine, grindstone.

Farm No. 3.—Cost of wiring house and barns, £15 10s.; cost of metres, £10 10s.; number of lights installed, 30; number of motors installed 2; size of motors, 3 horse power and ½ horse power. Machines operated by motors: Grain elevator, pump, cream separator, wood saw, wash machine.

Of course as farmers become more accustomed to the uses of the electricity and realise its advantages, they will apply the electric drive to their many other farm machines. Bearing in mind that electricity is available for both light and power, it is interesting to know what it costs a farmer. Based on an average of 5d. per kilowatt hour—equivalent to 3¾d. per horse-power hour—the cost of lighting amounts to a tenth of a penny an hour for a sixteen candle-power tungsten lamp. For power purposes the rate averages about 2½d. per kilowatt hour. It is said that when a horse begins to eat its head off, there are two ways out of the difficulty: either work the beast hard enough to earn its keep, or look around for a means of power with a more reasonable appetite. A one horse-power motor costs approximately £13, with an operating cost averaging 2½d. an hour. A good horse costs from £30 to £50, with an operating cost averaging 4d. an hour. A one-eighth horse-power motor equivalent to one man power costs £8, with operating cost of less than ½d. an hour. It has been estimated very carefully that the farm horse averages about 3½ hours of work a day the year round, and he eats fodder steadily. The electric motor, on the other hand, consumes energy only when it is in operation. Now some of the farm machines to which electric motor drive has been successfully applied and from which the cost of operation has been deduced by authoritative tests will be considered. These tests have been made under actual working conditions on farms, and though the figures are susceptible to slight variation, due to individual controlling circumstances, they afford a fair standard in considering the advisability of using electric power on the farm. All operating costs are based on the average power rate of 2½d. a kilowatt hour, and include interest on the investment at 6 per cent., depreciation of the machinery at 10 per cent., and labour hire when necessary at 7½d. per hour.

Operation.	Capacity of Machine per Hour.	H.P. of Motor required.	Kilowatt Hours required.	Operating Cost.
	Bushels.		Per bushel.	Per bushel.
Crushing oats	111	10	0·062	·4400d.
Shelling mealies on cylinder sheller	114	10	0·0448	·6850d.
Grinding ear mealies	40	15	0·411	2d.
Grinding shelled mealies	41·5	15	0·272	1·2400d.
Cracked shelled mealies	65	10	0·086	·6850d.
Threshing barley	145	20	0·1257	·3200d.
	Tons.		Per ton.	Per ton.
Cutting fodder	2	15	2·08	19·850d.
Six-roll shredder and husker	1·95	15	5·37	142·50d.
Root cutter	5·78	2	0·158	5·990d.
	Gallons.		Per cwt.	Per cwt.
Churning, working and washing butter	100	2	0·617	12·200d.
	Lbs.		Per cwt.	Per cwt.
Separating milk	1,300	1½	0·0386	1·4200d.
Grinding sausage	750	2½	0·441	5d.
Sausage stuffer	116	¾	0·0525	18·8800d.
Washing machine:	Washerful.		Per washerful.	Washerful.
(12 sheets per washerful)	3	¼	0·0616	2·2700d.
	Sq. ft.		Per 100 sq. ft.	Per eq. ft.
Portable vacuum cleaner	1,000	¼	0·0226	1·0350d.
	Horses.		Per horse.	Per horse.
Horse groomer	7	1	0·106	1·650d.

*Power charge only.

It must be remembered that the above costs cover both the price of the hired man and his keep. Though it will be discovered that some of the machines in the tests are of large capacity, it has been found in checking by tests of smaller machines of the same kind that the variation in unit cost—that is, per bushel or ton—was very slight, if any. It is needless to enumerate the many advantages gained by using electric power, as they are well known to most persons. As regards the farmer, however, there is one advantage which he appreciates more than anything else, and that is the saving of time and labour. The labour problem on farms all over the world, and especially in South Africa, where the natives are so undependable, is almost as vital as the maintenance of the fertility of the soil, and every labour saving device is greeted with open arms by the agriculturist.

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Special Mining Exhibition and "Safety First" Supplement,

TO BE ISSUED MAY 23rd, 1914.

A Special Illustrated Supplement will be included in the "S.A. Mining Journal" of May 23rd, dealing with the Third Annual Mining Exhibition. Among the chief contents will be the following:—

LEADING FEATURES.

The Use and Function of Mining Exhibitions.
Chemical and Metallurgical Apparatus at the Exhibition.
Mining Machinery and Models on View.
Some Natural Products of S.A. and their Industrial Possibilities.
The Promoters and Organizers of the Exhibition (illustrated).
New Devices and Labour-saving Inventions (illustrated).
Some Rock Drill Exhibits.
The New Hammer Drills and their Significance.
Some Stamp Battery Improvements.
The Progress of Modern Wire Rope Manufacture (illustrated).
Important Metallurgical Specialities.
Mine Rescue Apparatus and "First Aid" Appliances.
Results of S.A. Red Cross Society Competitions.

SPECIAL "SAFETY FIRST" SECTION.

The "Safety First" Committee Competition.
Winning Ideas and Devices (described and illustrated).
Progress of the "Safety First" Movement on the Rand.
A Review of Work Done by the "Safety First" Committee of the Rand Mutual Assurance Company.
Results of the Movement Elsewhere.
"Safety First" Devices (illustrated).
The Mines Department and the Movement.
The Mines Department Accident Museum (illustrated).

THE SOUTH AFRICAN MINING JOURNAL

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ELECTRIC TRACTION IN MINES.*

Some Practical Views—Latest American Practice.

[By CHARLES LEGRAND, Douglas, Ariz.]

In many iron, coal and copper mines where large tonnages are known before starting operation and proper provisions can be made, the problems of electric traction by trolley locomotives are not very different from those of surface plants. In such installations the gauge of the track, the radius of curves, and the clearances, both vertical and horizontal, can be made to suit the conditions of the traffic. It is more difficult to instal electric traction in mines which were started with hand tramming and where no consideration was given to the possibility of mechanical traction being used. The writer having had some experience in the installation of electric traction in copper mines, the following remarks apply more particularly to these mines. With the gauge of track usually 18 or 20 in., the weight limit of locomotives obtainable from manufacturers in this country varies from three to six tons. The full-load speed varies from four and a half to six miles per hour. These locomotives, being made to run on very small radius curves, have a short wheel base and a long overhang from axle to coupling, which necessitates a coupling with a good deal of lateral motion to avoid derailing the cars on sharp curves, especially if couplings are of the standard railroad automatic type. Although three-ton locomotives will run on 12 or 16lb. rails, it has been found more satisfactory to use 25lb. rails, as the track keeps in much better shape, it is easier to maintain the bonding in good order, and fewer derailments from dirt on the track occur with the larger rails. Where six-ton locomotives are used, the 25lb. rails are satisfactory, but 40lb. rails have proved cheaper where the traffic is heavy and the ground is soft, as the track maintenance is considerably lower with the heavy rails. The locomotives will run on 15ft. radius curves, but on through runs it is advisable not to go below 40ft. radius. The voltage used should not exceed 250 to 275 volts, and the trolley wire should be protected, to prevent accidental contacts, in front of chutes and at all points where it is low. With the air lacking somewhat in oxygen and the heat and high humidity prevalent in many mines, this voltage, which is considered perfectly safe, has proved fatal in several instances, and in such mines it is advisable to have a pulmotor available and men trained to use it in case of accident. The trolley wire should be protected from dripping water, and if the water is acid it must be protected; the writer has seen instances where a very small drip has cut a No. 00 trolley wire in less than three weeks. The track bonding should be kept in good shape. This is one of the most difficult things to do, as most of the trackmen in the mines do not realise the importance of it. A badly bonded track will increase the repairs of motors considerably, as in passing from a dead rail to a live one the sudden rush of current is liable to form an arc across the motor commutator or from the commutator to the ground. If the locomotive is not mounted on springs, it has been found advisable to put the resistance grids on springs, with flexible leads to the controller, as on small locomotives the cast metal grids are light and very easily broken. In a mine laid out for hand tramming, the grade is generally made in favour of the loaded car (this is also done to provide drainage for the mine), so that the load is fairly uniform going down with the loaded cars and coming up with the empty cars. This gives ideal conditions for a full load on locomotives at all times; but the motors on electric locomotives are seldom made so that the locomotive can deliver its full tractive effort continuously, and this ideal operating condition leads to overheating of the motors and very heavy repairs unless the number of cars attached to the locomotive is kept down to the maximum that the motors can pull without overheating. This is difficult in practice, as it seems against human nature to run a locomotive of any kind with a load that does not slip the driving wheels when starting or at every point in the track where conditions are a little unfavourable. The difficulty of getting motors of sufficient size in the small space available with 20in. gauge has obliged us in one or two instances where traffic is heavy and continuous to build our own locomotives, putting the motors above the wheels and gearing to the axles outside of the wheels. This makes a rather cumbersome design, but allows the use of larger motors, and has proved satisfactory in service. Even with this design the necessary clearance in the drifts limits the weight of locomotives to about seven tons. Where the tonnage to be handled is not great and yet mechanical traction is advisable, a storage-battery locomotive is convenient. The running expenses are not much greater than with a trolley system, depending on the conditions under which the locomotive has to operate. The Copper Queen Mining Company operated a three-ton storage-battery locomotive at Bisbee for over two years, under the worst conditions of any locomotive in their mines as regards track and curvature, and the results were better than the writer anticipated. To make use of one of the regular locomotives, the battery, consisting of 150 Edison cells, was mounted on a separate trailer. This battery had a total output capacity of 40 kw-hr., the average voltage on discharge being 180 volts. The first trays furnished to hold the cells were of the regular type for automobiles, and proved to have too small a clearance between cells. The hard bumping in switching, combined with very heavy sweating (due to the locomotive going from very hot portions of the mine with moisture-saturated atmosphere, to colder portions near the shaft) short circuited the cells externally. After the trays were altered to provide larger clearances and the cells were painted with insulating paint, there was no trouble from this source, although two or three cells were lost in a bad wreck. The power required at power station per useful ton-mile was approximately double that required with trolley locomotives, or 1·6 kw-hr., due to extra dead weight of battery car and lower efficiency of battery compared to trolley wire and track circuit, also to the losses in the motor generator used in charging the battery. With a locomotive designed to carry batteries the difference in power would be less. The power would also have been reduced if a motor controller had been used, grouping the cells in various combinations for starting, instead of a regular controller with starting resistances. The traffic got too heavy to be handled with this locomotive and it did not run long enough to get figures on depreciation of storage battery. The maintenance of the battery-locomotive motor was less than on the trolley locomotive, but no exact figures are available. The capacity of the battery was approximately 50 useful ton-miles on one charge. At the mines of the Copper Queen Mining Company, in Bisbee, the power used on trolley locomotives, measured at direct-current switchboard in power station, for the year 1912 amounted to 875 watt-hours per useful ton-miles. This amount, bowever, includes a few lights which are connected to the trolley circuit and gives too high a figure for the locomotives alone. It applies to cars with roller bearings, about one-half of the tonnage being carried in cars of two tons capacity and the other half in cars of one ton capacity. The conditions of the cars and track have quite an important bearing on power required per ton-mile, although the writer has no accurate figures. A rough idea can be formed from the fact that on a certain track in the mine of the Moctezuma Copper Company one three-ton locomotive cannot pull more than five cars of 20 cu. ft. capacity, equipped with regular Anaconda axles, without slipping the wheels, while the same locomotive pulls six cars of 22 cu. ft. capacity equipped with roller-bearing axles. For the year 1912 the cost of various items in cents per useful ton-mile at Bisbee for a total of 408,000 ton-miles was as follows: Locomotive maintenance, 2·95 cents; car maintenance, 1·64 cents; track maintenance, 5·24 cents; trolley maintenance, 3·60 cents; power, 1·64 cents. Locomotive maintenance includes all electrical and mechanical repairs and replacements on locomotives, as well as lubricating oil and supplies. Car maintenance includes all repairs, oil and

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*From the Transactions of the American Institute of Mining Engineers [subject to revision].

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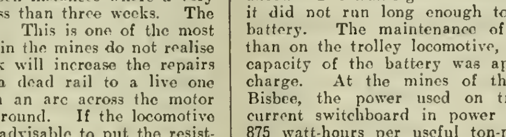

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supplies on cars. Track maintenance includes all track repairs and replacements, bonding, grading and realignment. Trolley maintenance includes all trolley-wire repairs and replacements, and repairs to protective trough around trolley wire. Track and trolley maintenance are very heavy, due to shifting ground. The cost of power (1·1 kw-hr. per ton-mile) is taken at the high-tension switchboard, and includes the loss in transforming the alternating current into direct current. In comparing power used by storage-battery locomotives and trolley locomotives, it would be fairer either to compare the actual input into battery with direct-current power used by trolley locomotives or use the alternating-current power input to rotary converter in both cases. In the case of the storage battery the input was approximately 1·28 kw-hr. per ton-mile, as against 0·875 kw-hr. for the trolley locomotive. The figures for power on storage battery are based on two days' test, and therefore are not as reliable as those on trolley locomotives, which cover a year's period.

Finance, Commerce, and Industries.

The S.A. Tobacco Industry.

Before the Dominions Commission Mr. W. B. Wilson presented the following evidence on the tobacco industry: The tobacco imports into South Africa in pounds sterling (exclusive of Rhodesia) were as follows:—

	1911.	1912.	1913.
Unmanufactured	£50,078	£39,574	£50,358
Manufactured	5,636	5,585	5,968
Cigars	62,591	54,479	49,923
Cigarettes	70,048	76,414	84,656
	£188,353	£176,052	£190,905

Exports:—

	1911.	1912.	1913.
Unmanufactured	£304	£2,748	—
Manufactured	6,396	11,831	—
Cigars	2,179	2,187	—
Cigarettes	8,364	7.452	—
	£19,943	£24,245	£30,385

As regards the trade with Rhodesia, he presented the following figures:—

Rhodesia to South Africa:—

	1911.	1912.
Unmanufactured	£29,597	£28,728
Manufactured	1,027	259
Cigars	15	9
Cigarettes	660	317
Totals	£31,299	£28,313

South Africa to Rhodesia:—

	1911.	1912.
Unmanufactured	£166	—
Manufactured	17,278	16,633
Cigars	1,095	792
Cigarettes	38,678	40,741
Totals	£57,217	£58,166

These figures show that last year South Africa imported more tobacco from oversea than in any year since Union, which would indicate that there is still a market for an increased production of the proper class of tobacco; but we who are interested in the industry do not want to feel even that we are bound by that limit. Unfortunately, we have no figures to show the exact production in Natal, but before Union the export was as follows:—1904, 1,129,359 lb.; 1905, 1,993,813 lbs.; 1906, 1,627,687 lb.; 1907, 1,401,251 lb.; 1908, 1,520,381 lb. Since Union there has been no record at all kept of the output of tobacco in this Province, but in my opinion it will not this year exceed 2,000,000 lb., and other men who are familiar with the agricultural movements of the Province think with me that the production has not apparently increased since 1905. The growing of it has been a neglected industry, but the manufacturers have done their best with what raw material they could get, and the quality of the cheroots and cigars has improved; but much more improvement is needed, and it must be in the class of tobacco offered to the manufacturer. We mean now to foster the industry, and improve the quality of the raw leaf, and to increase the production. The reason for the production not increasing in the past, and keeping pace with the times, is not due to the fact that the soil and climate are unfavourable to producing tobacco, but that the work has been in the hands of Indians, who handle the tobacco in so rough and dirty a manner as to keep the quality much below the standard that the climate and soil are capable of producing. The Indian, the way he is worked to-day, is the curse of the Natal tobacco industry.

* * * *

Steamship Rates.

The Chamber of Commerce submitted a statement to the Dominions Royal Commission recently, in which, while admitting the present steamship service was satisfactory, it urged the rates for the conveyance of merchandise were very excessive. The Chamber does not support the proposal to institute through bills of lading from England direct to the consignee, as it thought it would tend to interfere with trade arrangements. The Chamber advocated the cheapening of cable rates to Great Britain, and in regard to the railways the Chamber urged that the development of the country had

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been restricted by the system of imposing taxation through railway rates, which has conduced to the excessive cost of living, heavy wage account, and expensiveness of material. The rates were so arranged, it was submitted, that consignees in inland centres had to pay excessive rates in order to make up the losses on the working of the harbours, and on non-paying railway lines in the coast Provinces. The rates were not only inequitable, but also inimical to the proper exploitation of the country's resources. The Chamber supported a proposal that statistics as to production of trade, shipment, labour, etc., should be prepared on a uniform basis in the United Kingdom and all the self-governing Dominions, and that the information should be collated in a central office in London, and published in a form which would facilitate comparisons. Another proposal was that there should be a permanent exhibition in London of the productions of the several Colonies and Dominions. The Chamber protested against "side shows" purporting to represent native life, etc., as being false to the actual natural conditions, and calculated to have harmful results. Instead of a trade mark "made within the Empire," the Chamber preferred a system whereby the mark used should indicate the actual country or colony of manufacture.

* * * *

National Bank's Position.

A meeting of the directors of the National Bank of South Africa, Ltd., was held in Capetown on the 11th inst., when a resolution was passed to recommend the shareholders at the annual general meeting, to be held in Pretoria on May 29th, to make a distribution of profits earned during the year ending March 31st, in the following manner: To declare a dividend at the rate of 6 per cent. per annum; to place £20,000 to the reserve fund; to subscribe £30,000 to the pension fund; to allocate £80,000 entirely to eliminate the balance of the purchase price of the National Bank of the Orange River Colony; to reduce the bank prices account by £40,000, and to carry forward £27,000 to the current year. The proposed transfer of £200,000 to the reserve fund will bring the latter up to £700,000. The paid up capital of the bank being £2,350,000, there is thus a sum of over three millions sterling as security for depositors and for holders of the bank's notes. It is also intended to recommend shareholders to vote a bonus to the staff of the bank. During the year the bank's policy has included the building up of its reserve fund and the reducing of the bank's brick and mortar account.

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Meat Supplies of the World.

The following items of information, culled from various official reports and records, by the Director of the Municipal Abattoir, Johannesburg, are instructive in showing the vast opportunities open to this country in the way of exportation of frozen meat to the European markets. The steady and enormous growth of the American population, owing mainly to immigration from Europe, is gradually converting this important meat-exporting country into a meat-importing one. In fact, cargoes of chilled meat have actually been forwarded to the United States from the Argentine and Australia. Not only does this apply to the United States, but also with equal force to Canada, which some seven years ago exported large supplies of cattle and hog products. From 1902 to the present year shipments of meat have steadily declined, and the population of Canada now consumes the whole production she is raising, and will soon be in a position to draw supplies from other countries. Argentine.—The value of cattle in the Argentine has gone up during the last three years nearly 100 per cent., and there are indications that this country, with its overwhelming meat supplies, will be able in the near future to meet the normal demands from the United States. Japan.—Another country which is rapidly acquiring the meat-eating habit is Japan, their Army and Navy being now supplied with meat rations, and this factor will also affect the Argentine supplies. New Zealand and Australia.—New Zealand and Australia will undoubtedly benefit by the shortage in the Argentine, and the United States, as previously mentioned, is already drawing supplies from those countries. The Australian and New Zealand export trade in mutton and beef to the United Kingdom is on the increase. China and Manchuria.—China and Manchuria are progressing rapidly in raising hogs, and large shipments of frozen pork, bacon and hams are being exported to Great Britain. The enormous cost of freight, transportation and refrigeration, however, operates against this trade. Denmark.—Denmark supplies 40,000 hogs per week to the United Kingdom, but it is considered that she has reached her limit. Germany, Italy and France.—Germany, Italy and France have all received experimental consignments of frozen meat, and, owing to the "dear meat" cry, their demands for imported meat will increase in future. During the five years 1906-10, the United Kingdom imported 28 lbs. of fresh meat per head of the population, or, in other words, 40 per cent. of its requirements. With the advance of civilization and increased populations, other countries are finding that they require for their own consumption increasing quantities of meat, with the result that they have less to export. The shrinkage of the amount available from foreign countries is creating an overwhelming deficiency. The day is approaching when South Africa must find an outlet for its surplus live stock, and, by the aid of refrigeration, fresh meat can be landed in Europe for consumption all the year round. In view of the facts enumerated above, it is important to consider how far South Africa can benefit from this enormous and permanent industry. There are large tracts of land in South Africa admirably adapted for raising cattle and hogs, and every endeavour should be made to direct attention in this direction. To sum up the position, the consumptive demands of the world have overtaken the supply of beef, mutton, pork and their products, and a steady advance in the value of cattle, sheep and hog products may be expected in the future.

* * * *

The Natal Rubber Industry.

The Euphorbia tirucalli grows in profusion in most of the valleys in Natal up to and within 40 or 50 miles from the sea. It exists in countless millions in the valleys of the Tugela, Umkomaas, Umgeni, and Umzimkulu Rivers, and may be cultivated in the coastal belts of Natal and Zululand. It is found in its development in the lower lands and adjacent to water; nevertheless, it will thrive where moisture is practically non-existent. It responds amazingly to culture and fertilisation. The latex from the tree contains percentages of rubber varying from 12 per cent. to 15 per cent., and an average 74 per cent. of resin. According to Dr. Schidrowitz, the rubber, when extracted, is worth 80 per cent. of Para rubber. An expert who recently gave evidence on the industry stated: So far as my knowledge goes, the resin has not been produced on a marketable scale. And although a few tentative experiments have been made in regard to the suitability of this produce for the manufacturing of varnishes, I have no authentic data to submit in this respect. I am informed, however, that a first-class varnish has been produced from this resin, and that, provided sufficient quantities were available, a large varnish industry could be inaugurated in Natal. Many varieties of the Euphorbia family exist in Natal, but so far, the tirucalli has been the only variety it has been found practicable to work. The official returns of the Tirucalli Rubber Concession, Ltd., lately working the Tugela Valley Concessions, give as their return of crude coagulum produced up to March 25th, 1913, 223,836 lbs. net weight, roughly, 100 tons. I have no record of the output subsequent to that date. The majority of this coagulum has been sold either privately or on the open market, at prices varying from 4½d. (when first produced) to 10d. per lb. In Germany there exists a notable demand for the produce, but as in London, unless a settled supply is forthcoming the users of the material are disinclined to quote a specific price. There appears to be no doubt that apart from the possibilities this material in its crude form, scientific experiment will open up new fields of commerce in which the treated rubber may profitably be employed.

THE YEAR WITH THE JOHANNESBURG DISTRIBUTION TRADE.

Annual Review by Chamber of Commerce—Developments in Timber, Electrical and Mining Material Lines.

The annual report of the Johannesburg Chamber of Commerce contains some valuable references to the trading operations of 1913. *Inter alia*, the report has the following:—

Mining Material and Machinery.—The demand for goods from stocks was satisfactory during the first six months of the year, but fell off for a time until the labour disturbances had subsided. There was but little call for the importation of machinery, owing to the lack of capital available for development work. The total stores consumed by the mining industry in the Transvaal during 1913 were of the value of £11,610,791, as compared with £11,133,891 in 1912, showing an increase of £476,900.

DECLINE IN HOUSE BUILDING.

Timber.—The quantity of timber, especially log timber, used by the mines during 1913 was disappointingly small, and there are at present no indications of an increased demand, seeing that the sinking of shafts on the big propositions requiring shaft timbering, etc., is nearing completion, and it is unlikely that there will be any further opening up until general conditions improve and become more settled. The industrial disturbances affected the house-building trade considerably, and the lessened demand for timber caused the stocks to be unnecessarily heavy in proportion to the trade offering. In addition to these drawbacks, there was a serious break in the prices of Baltic timbers, and the desire to reduce stocks led to many lines being sold at even below cost price. For these reasons the year was by no means an encouraging one for the timber trade, nor will conditions improve until merchants recognise the dangers of over-trading.

Building Materials and Hardware.—There was a considerable decline in house-building activities during the past year, due principally to the industrial unrest, and firms supplying speculating builders must have suffered heavy losses owing to the number of insolvencies in the building trade. Some of these failures would have been avoided had it not been either for over-trading on the capital available or unbusinesslike methods of carrying out contracts. In the latter connection, the manner of dealing with extras has in many cases proved disastrous, and it would be well if contractors realised the importance of having a clear understanding with their architect and principal regarding extras, instead of waiting until the time for settlement of the final account arrives. The keen competition in the trade which was noted in last year's report has continued, aud, as there was a desire to reduce stocks, prices were often unduly cut.

Electrical Trade.—The year 1913 showed a slight improvement in the electrical trade as compared with 1912, and prices were fairly well maintained, except in a few lines—such, for example, as metal filament lamps and wattmeters. An unsatisfactory feature of present business, and one that calls for serious consideration, is the extended credits granted by wholesale importers to wiring contractors and retailers.

ADVANCE IN COLONIAL PRODUCTS.

Groceries and Provisions.—The trade for the year was on the whole fairly satisfactory. As was inevitable, the strikes greatly upset business along the Reef, and the country trade was handicapped by the drought, so that the last period of the year gave traders cause for some anxiety. As regards town business, a matter of serious consideration in the working expenses is the gradual extension of the area to be covered by delivery of goods. Prices on the whole remained normal, but certain lines advanced in sympathy with increased prices Oversea. The credit system is difficult to curtail, but the weekly payment of wages is assisting in this direction, while it also tends to equalise the cash trade done in the different weeks of the month. It is gratifying to note that Colonial products continue to progress in public favour.

Soft Goods (Wholesale).—While this trade during 1913 probably did almost as large a turnover as in the previous year, the conditions which prevailed rendered the net result less profitable. Business with country storekeepers was attended with many drawbacks. With the partial failure of the mealie crop, storekeepers experienced difficulty in collecting amounts due from the farmers, and there were many compositions, assignments and insolvencies. In the absence of an early frost, there is the prospect of a good half-crop being reaped this year in the Eastern Transvaal, but the indications are that, in the Orange Free State, owing to the prolongation of the drought, there will be very little betterment of the positon, and to this difficulty may be added another, viz., the ease with which storekeepers there can dispose of their businesses without public notification. The Chamber has urged the Government to extend the Transvaal Registration of Businesses Act to the Free State, but no such action has yet been taken, and meanwhile merchants have to risk losses which otherwise could be avoided. The conditions of the Reef trade are not satisfactory, because of the increasing tendency for credits to extend. What has largely contributed to this is the fact that in many instances large prices have been given for the "goodwill" of Government trading stands. These have been secured with borrowed money, and interest on the loan is given precedence over the amount due to merchants. If an agreement were arrived at between merchants as affecting the Reef trade, the credit system could undoubtedly be considerably curtailed. Taken all round, the opinion of merchants in this trade is that trading conditions in 1913 were worse than they have been for many years.

New Registrations.

The undermentioned companies, foreign companies, special and extraordinary resolutions, change of name, notices of increase of capital, notices of liquidation have been duly registered or filed during the month of March:—

NEW COMPANIES.

4392 The N.A.P. Pneumatic Tyre Syndicate (S.A.), Ltd., 22 Standard Bank Chambers, corner of Fox and Harrison Streets, Johannesburg; capital £10,000.
4393 Rand Live Stock Auctioneers, Ltd., Malk Buildings, Pim Street, Newtown, Johannesburg; capital £1,000.
4394 First South African Cordage and Spinning Co., Ltd., 7 and 8 Maxwell Buildings, Johannesburg; capital £100.
4395 The Coffee Creek Syndicate, Ltd., office of James Stewart Dyce, [illegible] Street, Barberton; capital £2,500.
4396 H. Heiberg, Ltd., 1 Transvaal Goldfields Buildings, Fraser Street, Johannesburg; capital £2,000.
4397 E. P. Bester, Ltd., Groenfontein No. 871, District Waterberg; capital £500.
4398 Lands and Minerals, Ltd., 58 Standard Bank Chambers, Commissioner Street, Johannesburg; capital £5,000.
4400 The African Chemical Manures (Acme), Ltd., 110 Main Street, Johannesburg; capital £3,000.
4401 The South African Commercial Travellers' Gazette, Ltd., Transvaal Goldfields Buildings, 6 Fraser Street, Johannesburg; capital £500.
4402 The Apollo Theatre, Ltd., Stands Nos. 351 and 356, Victoria Street, Germiston; capital £5,000.
4403 Wulfse & De Vries, Ltd., 140 Church Street West, Pretoria; capital £1,000.
4404 E. & S. Co., Ltd., 120 Cullinan Buildings, Simmonds Street, Johannesburg; capital £7,500.
4405 Charles Patlansky & Co., Ltd., 30 Fraser Street, Johannesburg, capital £4,000.

FOREIGN COMPANY.

4399 Waygood Lifts (South Africa), Ltd., c/o Alfred Hymans and/or John Leigh Bowden, Nos. 1 and 2 Mutual Buildings, Harrison Street, Johannesburg; capital £10,000.

SPECIAL AND EXTRAORDINARY RESOLUTIONS.

667 Pretoria Portland Cement Co., Ltd., Pretoria—Amendment of memorandum.
3282 The Denver Rock Drill and Machinery Co., Ltd., Johannesburg—Amendment of articles.
4235 The Union Bond and Guarantee Corporation, Ltd., Johannesburg—Increase of capital.
4212 Haarhoff & Bennett, Ltd., Johannesburg—Amendment of articles.

CHANGE OF NAME.

3472 Dunlop Pneumatic Tyre Co. (South Africa), Ltd.—Dunlop Rubber Company (South Africa), Ltd., Johannesburg.

NOTICES OF INCREASE OF CAPITAL.

1124 The Clydesdale (Transvaal) Collieries, Ltd., Johannesburg—increased from £180,000 to £185,000.
4235 The Union Bond and Guarantee Corporation, Ltd., Johannesburg; increased from £5,000 to £50,000.

VOLUNTARY LIQUIDATION.

3216 Malgo Developing Syndicate, Ltd., Johannesburg.
4215 H. L. Adler & Co., Ltd., Johannesburg.
1450 McQuirk Syndicate, Ltd., Pretoria.
1309 African Hotels Co., Ltd., Johannesburg.
4187 Pipe and Fence Yard, Ltd., Johannesburg.
3606 Patent Non-Corrosive Metal Syndicate, Ltd. (Foreign Company), Johannesburg.
1726 Wildebeestfontein Coal Syndicate, Ltd., Johannesburg.

ANSWERS TO CORRESPONDENTS.

E. A. T. (Benoni).—We know of no vacancies for such men at present.

"Spec."—We do not give sharemarket tips.

"Anxious."—The venture is unknown here—it seems purely of Capetown interest.

THE WEEK IN THE SHAREMARKET.

Quiet Owing to American War—Steady Undertone.

The market was generally quieter this week owing to the Mexican trouble, without, however, any pressure to sell. Tins were weaker on the lower price obtaining for the metal; and diamonds on the prospects of a restricted American market until the close of the present trouble. Rand dividend payers, if anything, were steadier in view of the approach of the dividend season; and all the gilt-edged Rand stocks offering are quietly picked up. The Modder group of mines and Van Ryn Deeps are the most popular features; and nearly all Barnato stocks appear on the up grade. The native labour supply is daily improving in numbers and efficiency; and the increased use of small rock drills is bound to have a material effect on working costs during the coming months. A real and steady process of costs reduction is now going on; though the effect may take a few months to show itself. In the meanwhile a steady enhancement in the value of Rand dividend payers will go on.

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	Fri., 17th.	Sat., 18th.	Mon., 20th.	Tues., 21st	Wed., 22nd.	Thurs., 23rd.
Adair-Ushers	0 5*		0 5*	0 5*	0 5*	0 5*
African Farms..	13 6	13 4*	13 3*	13 3	13 0*	12 11
Apex Mines ...	18 3*	18 0*	18 6*	18 0*	18 0*	18 0*
Bantjes Consolidated ..	14 0*	14 0*	14 0*	—	14 0*	13 9*
Benoni Consolidated ...	1 9*	1 9*	1 9*	1 9*	1 9*	1 9*
Breyten Collieries	—	—	27 6*	27 6*	27 9*	27 6*
British South Africa	—	—	—	—	—	17 6*
Bushveld Tins...	0 7*	0 7	0 7*	0 7*	0 7*	0 7*
Cassel Coals	15 0*	15 0*	—	15 0*	15 0*	15 0*
City and Suburbans... ...	47 0*	47 6*	48 0*	47 0*	47 9*	47 6*
City Deeps	64 6*	65 0	66 3*	66 0	64 9*	65 6†
Cloverfield Mines	—	4 6	4 6*	—	4 6*	4 3*
Clydesdale Collieries	9 0*	9 6*	—	9 0*	9 0*	9 0*
Concrete Construction ...	—	—	1 0*	—	—	—
Cons. Investment	—	21 0†	19 0*	—	21 0†	—
Cons. Langlaagtes	—	32 6*	32 3	32 6*	32 3*	32 0*
Cons. Main Reefs	17 10	17 9*	18 0	17 9	17 6*	17 6*
Cons. Mines Selection ...	—	—	8 0*	8 0*	—	7 0*
Coronation Freeholds	0 4*		0 4*	0 4*	0 4*	0 4½*
Crown Diamonds	8 0†	8 0†	8 0†	—	—	—
Crown Mines Debentures...	£98*	£98*	£98*	—	—	£98*
Durban Roodepoorts	18 0*	—	16 6*	—	16 0*	16 0*
Durban Rood. Deeps	18 0*	18 0*	18 0*	—	—	—
East Rand Centrals	2 2*	2 2*	2 2*	2 1*	—	—
East Rand Coals...	1 8*	1 8*	1 7*	1 8	1 7*	1 7
East Rand Deeps...	1 6*	1 6*	1 6*	1 6*	—	—
East Rand Props....	37 6	37 0*	37 0*	—	36 0*	35 0*
East Rand Debentures ...	£83*	—	£83*	£83*	£83*	£83*
Eastern Gold Mines	1 1	1 0*	1 0*	1 0*	1 0*	1 0*
Ferreira Deeps	50 0†	—	—	—	—	—
Frank Smith Diamonds ...	4 7*	4 8	4 9	4 8	4 6*	4 6*
Geduld Props.	—	24 0*	24 0*	24 0*	24 0*	23 6*
Geldenhuis Deeps	—	—	26 0†	—	—	—
Ginsbergs	17 0*	17 0*	17 0*	17 0*	17 0*	—
Glencoe Collieries...	6 6*	—	6 9*	6 0*	7 0†	6 9*
Glynn's Lydenburgs	10 6*	10 6*	—	—	—	10 6*
Government Areas	20 9	20 9	20 9*	20 6*	20 6*	20 3
Jhb. Board of Executors...	—	25 0†	—	25 0†	—	—
Kaalfontein Diamonds ...	0 5†	—	—	—	—	—
Klerksdorp Props.	2 3*	2 3*	2 3*	2 3*	2 4*	2 4*
Knight Centrals...	9 7*	10 0†	9 9	9 6	9 3*	9 0*
Knights Deeps	37 6*	37 6	—	36 6*	—	—
Lace Props.	3 2*	3 3*	3 2	3 0*	3 1*	3 2*
Luipaardsvlei Estate	—	10 0*	—	—	10 3†	—
Lydenburg Farms	2 8*	2 8*	2 7*	2 8*	2 8*	2 8*
Main Reef Wests	6 9*	6 6*	6 6*	6 9*	6 9*	6 9*
Main Reef West Debs. ..	£70*	—	£70*	£71*	£71*	£71*
Meyer and Charltons... ...	106 3*	107 6*	—	—	—	—
Middelvlei Estates	1 0*	1 0*	1 1*	1 1*	1 0*	1 0*
Modderfontein B.	82 0*	82 6*	83 0*	82 6*	83 0*	80 0*
Modderfontein Deeps... ...	46 3	47 0	47 3	47 0*	46 9*	46 6*
Natal Navigation Colls. ...	15 0*	—	15 0*	—	15 6†	—
New Boksburgs	0 9*	1 0†	0 9*	0 9*	0 9*	0 9*
New Eland Diamonds... ...	—	—	—	28 0†	—	28 0†
New Era Cons.	5 9*	5 9*	5 9*	5 9*	5 9*	—
New Geduld Deeps...	1 9*	1 9*	1 9	1 9*	1 9*	—
New Gochs	12 6*	12 6*	12 6*	—	12 6*	—
New Heriots	60 6*	—	60 6*	61 0*	60 6*	60 6*
New Kleinfonteins	23 6	23 0	23 0*	22 9*	23 3	23 0
New Modderfonteins	250 0*	250 0*	250 0*	250 0*	250 0*	—
New Unifieds	—	—	—	—	15 0*	15 0*

*Buyers. †Sellers.

	Fri., 17th.	Sat., 18th.	Mon., 20th.	Tues., 21st.	Wed., 22nd.	Thurs., 23rd.
Orange Diamonds .	1 6†	1 2*	1 1*	—	0 9*	0 9*
Piggs Peak	—	10 0*	—	—	10 0*	—
Pretoria Cements ...	45 0*	45 0*	45 6*	45 6*	45 6*	45 6
Princess Estate	—	—	—	—	4 9*	—
Rand Klips	2 6*	2 6*	2 5*	2 5	2 6	2 4*
Rand Nucleus	1 7*	1 7*	1 7*	1 7*	1 7*	1 6*
Randfontein Deeps...	3 3*	3 3*	3 3*	3 3*	3 3*	3 3*
Randfontein Estates	22 6*	22 9*	22 9*	—	22 0*	22 3*
Roberts Victors...	20 0*	20 0*	—	—	—	20 0*
Robinson Deeps	30 0†	—	—	30 0†	30 0†	—
Rooiberg Minerals	24 0*	24 0*	24 0*	24 0	23 6	22 0*
Ryan Nigels	—	3 0†	3 0†	3 0†	—	3 0†
Shebas	4 6*	4 6*	4 6*	—	4 6*	—
Simmer Deeps	2 3*	2 3*	2 3*	2 3*	2 3*	—
S.A. Breweries	—	40 0*	40 0*	—	—	—
S.A. Lands	—	2 10*	2 10*	2 10*	2 10*	2 9
Springs Mines	13 3*	13 0*	—	—	—	13 3†
Sub Nigels	—	11 6*	11 6*	11 0*	11 0	—
Swaziland Tins	—	—	—	—	30 0*	30 0*
Transvaal Coal Trust ..	28 6*	28 6*	28 6*	28 0*	28 0*	28 3*
Transvaal Cons. Lands ..	—	20 0*	—		—	—
Transvaal G.M. Estates ...	37 3*	38 6†	37 0*	—	36 0*	—
Tudors	—	2 0†		—	1 0*	—
Van Ryn Deeps... ...	45 0*	45 6	45 6	45 0*	45 0*	44 9*
Village Deeps	35 9*	36 3	36 3*	36 0*	35 6*	—
Vogelstruis Cons. Deeps .	—	—	—	—	1 0*	—
Western Rand Estates .		1 6*		—	1 9*	2 0*
West Rand Cons.	8 0*	8 3*	9 0	—	—	—
Witbank Collieries	43 9*	44 0*	44 0*	44 0*	44 0*	44 0*
Witwatersrands	—	69 0*	70 0	—	69 0*	70 0†
Witwatersrand Deeps...	54 0*	—	54 0	53 6*	53 0*	—
Wolhuters	15 3*	15 6	15 6	15 0*	15 6	15 0*
Zaaiplaats Tins	25 6	25 6	25 9	25 6	23 6*	23 6*

*Buyers. †Sellers.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

May 6.—Van Dyk Proprietary; Lancaster West; Tudor; Modder Deep Levels; Geduld Proprietary; Princess Estate; May Consolidated (annual).
May 15.—Bucks Reef (special); Marievale Nigel; Wit. Deep (annual).
May 20.—Apex Mines, New Kleinfontein (Annual).
May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).
May 27.—Consolidated Langlaagte Mines; Ginsberg; Glencairn; Government Areas; New Primrose; New Rietfontein; New Unified; Van Ryn Deep; Witwatersrand G.M. (annual).
May 28.—West Rand Consolidated; Roodepoort United; New Goch; Meyer and Charlton (annual).
May 29.—Cloverfield; Vogel. Deep; Knight Central (annual); Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries; Sacke Estates (annual).
June 2.—Modder. B.; Bantjes (annual).
June 3.—Crown Mines; Durban Roodepoort Deep; Village Deep (annual).
June 17.—S.A. Gold Mines; Leeuwpoort Tins; African Farms.
June 22.—Robinson Deep (annual).
June 23.—Transvaal Consolidated Lands (annual).

Swaziland Tin.

The following are the particulars in regard to this company's operations for the month of March, 1914:—Concentrates recovered, 40·234 long tons; estimated profit (taking the price of tin at £164 per ton), £1,349.

MINING INSTITUTE.
TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.
Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S. MECHANICAL ENGINEER'S.
MINE OVERSEER'S. ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S,
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100 PER CENT. PASSES IN RECENT EXAMINATIONS.
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SOUTH AFRICAN RAILWAY TOURS.

Some Details of What the Railways Are Doing to Foster Travel.

Although facilities are offered by the Railway Administration for visitors to spend their mid winter vacation at such places as Durban, where the weather is more congenial than that of the Rand at the particular season of the year mentioned, little has been done to afford visitors from the Coast an opportunity of paying return visits to their friends or becoming acquainted with the inland towns. This, however, will be changed this year, for the Administration has agreed to the issue of tickets at a single fare for the double journey to all S.A.R. stations during the period 19th to the 30th June (inclusive), the return journey to be completed by midnight on 3rd August. This period of availability will coincide with the mid-winter school vacation, and enable parents to call for their children when school breaks up and take them away for a change, the while enjoying such change themselves.

THE LURE OF THE FALLS.

The special excursion trains periodically run to the Victoria Falls are considering the excellence of the accommodation, perhaps the best value railway passengers ever had for their money anywhere. Not only do they see much of the best the country has to show, but they do so travelling in the latest saloons, drawn by the fastest engines, and catered for by the most experienced chefs and stewards the Administration possesses; and the charge, which includes railage, meals and bedding for the entire trip, and motor cars to outside places of interest, amounts to little more per day that it would cost them to sit idle in a good hotel. Elsewhere travel is mainly for the wealthy; in South Africa it is thus placed within the reach of all. Indeed, it is almost cheaper, everything considered to spend one's holiday travelling, than to confine it to any one resort. In fact, so popular have these special railway tours become that the Administration has decided to extend them. During the present season the usual excursion trains will run direct to the Victoria Falls, commencing from Capetown on 4th June and from Johannesburg on 6th July.

A SPECIAL TOURING TRAIN.

But, in addition, a special touring train for the Victoria Falls will leave Capetown on 22nd June and travel through the beautiful South-West District, enabling passengers to visit George, one of the most charming villages in the country; to enjoy our grandest mountain railway journey, over the Outenequas; to visit Oudtshoorn, and the adjoining Cango Caves, the finest stalacite caves in the world; and to become acquainted with Bloemfontein, Johannesburg, Pretoria, Cullinan and the Premier Mine, Zeerust, Bulawayo, Khami Ruins, Matopos, Victoria Falls and Kimberley.

The round trip will occupy approximately fifteen days, which will allow from four to fifteen hours in each of the intermediate towns mentioned, and four days at the Victoria Falls. The fare, £23 per passenger, includes first-class rail journey, meals, bedding and attendance upon the trais and at the Victoria Falls, conveyance by motor car to Khami Ruins and World's View, and lunch at the Matoppos. If accommodation on the trains is available passengers from other stations than those mentioned will be booked at specified fares according to the distance to be traversed. Early application for accommodation, however, should be made, as it is anticipated the trains will be fully patronised.

TOUR OF THE PRINCIPAL INLAND TOWNS.

An excellently-appointed touring train will, on June 20, leave Capetown for Pretoria, arriving back in Capetown on June 26, and enabling passengers to spend a while at Mossel Bay, George, Oudtshoorn, Bloemfontein, Johannesburg, Premier Mine (where they will be conducted over the property), Pretoria and Kimberley. The inclusive fare is £13 per passenger from Capetown, and proportionate charges from Port Elizabeth, East London, Bloemfontein and intermediate stations, provided accommodation is available.

These fares cover first-class rail journey, the cost of meals, bedding and attendance upon the special train and the prescribed Main Line connecting trains.

CHEAP LONG-DISTANCE FARES.

Nor are these the only innovations to assist everybody to a thorough acquaintance with the country, and to promote increased intercourse between Inland and Coastal residents. Upon certain days during the months of April and May excursion fares will be issued from stations in the Cape and Natal Provinces, and the majority of stations in the Transvaal and Orange Free State, to Johannesburg and Pretoria, in connection with the autumn season.

During the months mentioned one may journey to Johannesburg and Pretoria for £3 15s. from Durban, first class return, and for £6 10s. from Capetown; the fares from other stations being proportionately low according to mileage, and the second-class excursion fare being about a third cheaper than that of the first-class.

The Johannesburg Gala will be in full swing up to the 15th May, and both Johannesburg and Pretoria are offering many attractions to down-country visitors.

CHEAP SHORT-DISTANCE FARES.

On each Monday, Wednesday and Friday during the period 20th April to 15th May, first and second-class tickets at single fare for the return journey will be issued to Johannesburg from stations in the near vicinity. It will thus be seen that every effort is being made by the S.A. Railways to induce the inhabitants of South Africa to visit other parts of the Union than their own locality.

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*Reprinted from the "South African Railways and Harbours Magazine," April, 1914.

Union Finances: Year's Figures.

The Exchequer receipts and issues for the year ended the 31st of March are published in this week's *Gazette*. The receipts, including opening balances on the revenue account, were £15.982,068 15s. 11d. as against £17,465,573 5s. 9d. for last year. The total receipts, including those on loan account, were £38,567,639 5s. 2d. as against £22,173,458 17s. 11d. for last year. The issues totalled £36,407,516 13s. 7d., leaving a balance of £2,160,122 11s. 7d.

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Automobile Notes.

SOUTH AFRICAN MOTOR LEGISLATION.

Review of the New Laws—A Tangle of Conflicting Requirements.

Last year the Provincial Councils of the Cape, Transvaal, Natal, and Orange Free State all passed Motor Ordinances. These came into force on New Year's Day, and in each Province there was simultaneously promulgated a series of new "regulations" under the Ordinances. The requirements in the several States are all different, not only in regard to the basis of taxation, but in other matters. The Transvaal Ordinance provides that in certain circumstances the motorist must slow down. In exactly similar wording the Natal Ordinance enjoins like caution, but, in addition, specifies eight miles an hour as the outside limit of speed. In the Free State Ordinance the speed limit in such case is ten miles an hour. In all four Provinces it is provided that both drivers and cars shall be licensed. Drivers have first to submit to a competence test, which consists of an examination in car control and the observance of the usual traffic rules. The examiners, whenever possible, include one or more members of a recognised automobile club. The fees for a driver's licence, which does not require renewal, are 10s. in the ,Cape Province and the Free State, 10s. in the Transvaal, and not exceeding 10s. in Natal (the amount to be fixed by Provincial regulation or borough bye-law). In the Free State the car licence is a non-renewable one costing 40s. per car, irrespective of size. In the other Provinces car licences are renewable annually. The fees under the Cape and Transvaal laws are fixed on a sliding scale. In the Cape the scale is 30s. for a car 1,500 lbs. or under; over 1,500 lbs. and up to 2,500 lbs., 40s.; over 2,500 lbs. and to 4,000 lbs., 60s.; over 4,000 lbs. and to 6,000 lbs., 100s.; and over 6,000 lbs., £10. In the Transvaal fees are charged on the following basis: For every car a basic charge of £2, plus a shilling for every unit of horse-power ($\frac{D^2 \times S \times N}{200,000}$ formula) and 2s. for every 100 lbs. of weight. The annual car licence fee in Natal must not exceed £3 per car (the amount to be fixed in the same manner as drivers' licence fees), power being reserved to differentiate by regulation or borough bye-law between the fees for cars according to horse-power. In the Cape, Transvaal, and Orange Free State dealers and manufacturers (of which latter there is at present none in the country) are called upon to pay an annual licence fee of £10. In Natal the dealer's licence fee is not to exceed £3 per annum. (Motor dealers, it may be said in passing, have not been absolved from their previous obligations in respect of licence fees which are common to all traders in the country, the licence fee under the Motor Ordinances being an additional charge on them.) For this consideration dealers may run their cars while on trial by prospective buyers, the period during which any one car may be run being, in the Transvaal, one month. Excepting in the Cape, the Provincial Councils have determined all municipal and other regulations applying to motor cars, and local authorities are excluded from legislating in respect of any class of motor vehicles. The Cape Ordinance, on the other hand, only determines the powers of local authorities to deal with motor cars not plying for hire. In this way the Cape taxi owner is still liable to be taxed by municipalities. Capetown taxis hitherto have paid an annual Corporation licence fee of £3, and as this amount is still being demanded by the municipality, a large number of owner-drivers are seriously affected, and firms running taxi fleets are being badly hit. Car licences issued in any other Province are valid in Natal during the whole period of their currency. In the Cape and the Transvaal such licences may only be used during three months in any calendar year, and in the Free State for a continuous period of one month. But while South Africa is making strenuous efforts to encourage tourists from overseas, it is curious to note that no concessions are made by any of the Provinces in favour of tourists from other countries who may bring their cars with them. The Transvaal Ordinance abolishes the speed limit, except in special circumstances or within specially defined limits, but substitutes a restriction upon motorists to drive with due regard for the nature, condition, and use of the road, and to the amount of traffic which is actually at the time thereon. Under the Cape and Natal laws the maximum speed in populous areas is limited to thirty miles and hour, and under the Free State law to twenty miles an hour. In the Cape speed limits under twenty miles an hour may not be fixed by local authorities except for special reasons. The evidence of one witness supported by measurements as to time and distance is sufficient in the Cape to convict in cases of exceeding the speed limit, but in the other Provinces the evidence of two witnesses is essential, and measurements have to be taken.

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The Alcohol Fuel Question.

The Alcohol Motor Fuel Committee of the Imperial Motor Transport Council has issued a preliminary report, from which we take the following:—Granted that the demand for petrol is overtaking the supply, and that the industrial community is likely to be faced with a shortage of fuel suitable for use in high speed internal combustion engines, the situation appears to be full of danger, and to demand immediate and complete investigation. Coal tar products have been proposed as substitutes for petrol, and there is no doubt as to their suitability. As regards these fuels, the outstanding question relates to the extent of the present supply, and the possibilities of its extension. It does not appear justifiable to assume that proposed substitutes of this kind will become available in sufficient quantities to afford any complete and permanent solution of the problem. If this be so, we are compelled to turn to alcohol in the belief that it affords the only possible escape from the difficulties in the present position. In this connection, and in view of the importance of rendering the British Empire independent of fuel supplies from foreign countries, it should be noted that crops from which alcohol can be obtained might be cultivated with great benefit to the agricultural community in many parts of the Empire. In the great majority of the Dominions and Colonies, alcohol offers the only feasible relief from abnormally high prices and shortage of supplies. The problem of the investigation and utilisation of alcohol must necessarily be divided into a number of branches. The problem as regards the British Isles can be divided into two portions:—(a) The utilisation of alcohol as a fuel for industrial and agricultural engines of medium or low speed type. This includes engines for tractors of heavy and medium weight. Granted that a suitable fuel even of a somewhat new type were available in quantity at a low price, and particularly at a price which could be guaranteed, there is no reason whatever why a great industry should not be built up with new and specially designed engines to suit the fuel. Such engines have been made and are running to the number of several thousand on the Continent of Europe with alcohol as a fuel. (b) The utilisation of alcohol in high speed internal combustion engines. This branch of the problem is here rendered more difficult, owing to the enormous number of such engines already in existence, and designed specifically for use with fuels at present available. Consequently, the problem would seem to be the production of some mixture of the new fuel with an existing fuel, this mixture being suitable for use in the existing type of engine, and serving materially to increase the total fuel supply during the transition period, while the present type of engine is being gradually modified to suit the new conditions. The problem as regards the Empire overseas is in some respects less complex, since the number of internal combustion engines in use is not so great, and it would, therefore, be more feasible to encourage immediately the use of types designed to suit the new fuel. In certain of the Colonies the question of coal spirit, unless this be imported, does not come into account. On the other hand, many of the Colonies are eminently well situated with a view to the cheap production of alcohol in quantity.

The motorists of Mafeking have decided upon the formation of an Automobile Club for that district.

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CONTENTS. PAGE

Notes and News ... 239

Topics of the Week:

The New Industrial Legislation ... 241
The S.A. Institution of Engineers and the Industry 242
The Budget and the Mining Industry ... 242
Progress of Tin Mining in the Transvaal ... 243
The Rand's Deepest Mines ... 243
The Mining Situation in Rhodesia ... 244
The Manager and Staff of the Simmer Deep, Ltd. ... 245
The Rand's Ore Reserves: Some Further Aspects ... 246
Relation of Geology to Mining—II. ... 247
Geological Features of the Central Congo ... 248
The Economics of Voorspoed Mine Operations ... 248
Accident Prevention in Mining ... 249
Mining Men and Matters ... 249
The Year with Roberts Victor Diamonds ... 250

Rhodesian Section:

Latest Mining News ... 251
Correspondence and Discussion: "The Prospector's Shortcomings"; "What Rand Mining Owes to Geology" ... 252
Position and Prospects of Crown Diamonds ... 253
Concentration of Diamondiferous Ground as Applied at De Beers—II. ... 254
The Week in the Sharemarket ... 255
Engineering Notes and News ... 257
The Question of Cast-Iron v. Steel Pipes ... 257
Finance, Commerce and Industries ... 259
Automobile Notes ... 261

Notes and News.

The Dust Report.

It is a pity that the Phthisis Prevention Committee cannot issue the latest report on mine dust to the Press, owing to some difficulty about obtaining the consent of the Minister of Mines. The report is of the first importance, and of great public interest. It is understood that the exhaustive tests carried out under the aegis of the Department of Mines and the Phthisis Prevention Committee show that the dust in the majority of the mines of the field has now been reduced below the arbitrary maximum fixed by the Department of five milligrammes per cubic metre. The opinion is authoritatively expressed that the phthisis evil has at last been distinctly checked. We trust the report will be given to the public without unnecessary delay.

* * * *

The Coming Diamond Conference.

Diamond circles are greatly interested in the forthcoming congress of producers in London, at which the Union and German Governments are to be represented. It will be remembered that it was recently announced that the firm of L. Breitmeyer and Co., acting for the Diamond Syndicate who control the De Beers output, have acquired 500,000 carats of German diamonds, with the option of another 500,000 carats. Other important interests having also tendered, it would appear that the Diamond Syndicate have offered the highest price. The temporary settlement of the acquisition of these diamonds should certainly have a beneficial influence upon the diamond trade, and, consequently, also on the price of shares in the producing diamond companies. We say the temporary settlement advisedly, as the purchase just concluded only deals with a very small portion of the stocks of rough diamonds held by the German Government We understand that these fields are able to produce a minimum of 200,000 carats a month, and no doubt the German Government is sufficiently well-informed to know of the failure the present buyers made in connection with their first Premier contract. It would appear, therefore, that with this first purchase of 500,000 carats the Diamond Syndicate are more or less on their probation with the German Government. The results of the coming conference will, of course, be watched with interest

* * * *

Unification of the Rand.

Mr. Grobbelaar's question—based on an incorrect newspaper report—dealing with Mr. Schumacher's attitude towards amalgamation, was disposed of in the House of Assembly this week. He asked the Minister of Mines whether his attention had been drawn to a statement by Mr. Schumacher before the Royal Dominions Commission, from which it clearly appeared that Mr. Schumacher, representing the Central Mining and Finance Corporation, Ltd., was in favour of an amalgamation of the mines, although not considering it practicable at the present moment for political and other reasons; and whether the Government was taking any steps to counteract the tendency which existed amongst the mining groups to amalgamate the mines, in view of the serious effect which the amalgamation of the Kimberley mines had on the population and town of Kimberley. The Minister, in reply, said he was not aware of the statement referred to, but understood that the evidence given by Mr. Schumacher was against amalgamation. The question was of so academic a character at present that he (the Minister) did not think there was any cause for action on the part of the Government.

* * * *

Mr. Poutsma on Rand Mining Conditions.

Mr. Poutsma contributes an article to the current issue of the *Contemporary Review*, with the obvious purpose of prejudicing the Union Government and the employers in the eyes of the Home public. He dwells on the unfavourable conditions for the workers in the gold mining industry. The low grade of the ore is emphasised in relation to the "enormously inflated stock with which the industry has been watered by promoters and gamblers." The mines are represented as having, on account of over-capitalisation, to be worked by "grossly under-paid" and virtually "slave" labour. All this, of course, is a calculated appeal to the sentiment of Exeter Hall. The fact that the native labour force of the Rand is constantly changing, that the natives are only here for short periods, and at the expiration of their contracts are free to return to their kraals, is conveniently ignored. It would, of course, be easy to convert the native labour force into a constant and reliable factor were the considerable proportion of natives who are capable of higher positions given a prospect of advancement. It will be recollected that it was a Labour spokesman who, before the Dominions Commission, was most uncompromisingly emphatic on the imperative need of keeping the native "in his proper place." On the vexed subject of miners' phthisis, Mr. Poutsma remarks, *inter alia*:—"Nothing is done by the mine management to minimise the danger by laying the dust, which could easily be done by means of spraying, etc., but of course this would mean expense and reduction of profits." This, of course, is a flagrant abuse of the truth. Mr. Poutsma's allegations are given a direct denial in the last annual report of the Government Mining Engineer.

* * * *

Crown Diamonds. Elsewhere in this issue will be found a report of the proceedings at the annual meeting of the Crown Diamond Mining and Exploration Company, Limited. From the Chairman's speech it will be seen that the new aerial gear at the mine is now in operation, and that much improved returns may now be expected. The slump in the market for the stones has, of course, affected the company, but the forthcoming concerted action by the big producers should have a good effect. Messrs. Lewis and Marks have shown courage in financing the property, and their enterprise promises to be duly rewarded. Given a good market for the stones, the company should not take long to reach a sound financial position.

* * * *

The Chamber of Mines Analysis Sheet. The output analysis sheet issued by the Transvaal Chamber of Mines for March shows that 51 companies contributed to a total output of £2,793,768 from 2,094,098 tons milled, which yielded a total profit of £945,000, being at the rate of 9s. 1d. per ton milled. Stamps in operation numbered 9,120, and tube mills 282. The percentage of waste rock sorted out on surface was 9.71, the recovery averaged 26s. 4d., and working costs 17s. 3d. per ton. In the outside districts 55,503 tons were milled for an output of £123,578, or 36s. per ton, working expenses were for eight companies 22s. 3d. per ton, and the aggregate profit was £39,759. Contrasting figures for the whole Province in respect of February and March results, it is to be noted that the March profit was greater by £124,400, or 2d. per ton. Working costs were 17s. 4d., as compared with 18s. 1d., and the yield was 26s. 7d., as against 27s. 1d. per ton. Total dividends distributed in March, 1914 were £245,000, as against £370,845 in March, 1913.

* * * *

The Roberts Victor. On another page will be found the speech delivered by Mr. J. Emyrs Evans at the annual meeting of the Roberts Victor Diamond Company, held in Johannesburg a few days ago, and also extracts from the report of the Consulting Engineer. Perusal of these should make the position at the mine clear, and it must be admitted that considering all the difficulties the company has of late had to contend with, the payment of a dividend of 10 per cent. in respect of last year's operations, and the carrying forward of a fairly substantial balance to the current account, is an achievement upon which the company is to be congratulated. From the Consulting Engineer's statement, it will be gathered that the treacherous nature of the shale walls of the mine which has rendered it necessary to remove an enormous quantity of reef matter, has been a great obstacle to continuous working. The state of the mine was also responsible for the delay in resuming washing operations until the beginning of March. It is satisfactory to note that the average yield of diamonds is being maintained. A very considerable amount of prospecting work was carried out on the farm Damplaats during the year, and whilst no discoveries of importance have so far been made, it should be remembered that a large portion of the property is still unexploited.

* * * *

New Coch Profits. Amongst the mines of the Main Reef series none have recently announced a more marked improvement in profit earning than those controlled by the General Mining and Finance Corporation, and commonly referred to as the Albu Group. The most noteworthy subsidiary of this group in so far as recent improved profit is concerned, has undoubtedly been the New Goch. The profit earned by this company in March was £10,016, which is the best result obtained in any month since July, 1911, and in comparison with the February return constitutes an advance of £2,635. Working costs, which in February were at the rate of 16s. 6d. per ton, were in March reduced to 15s. 4½d. This improvement in the affairs of the old Goch is certainly satisfactory, and in conjunction with that at the adjacent Wolhuter is being watched with keen interest.

* * * *

"The Round Table" and the Rand Strike. That excellent quarterly review of Imperial affairs, *The Round Table*, has an article in the current issue on the Rand strike, which is in some respects admirable. The attempt at an analysis of the causes of the strike are, however, very far wide of the mark and quite unworthy of a publication otherwise so well-informed on Imperial affairs. *The Round Table* traces the trouble to (a) miners' phthisis, and (b) the lack of personal touch between employers and the men. It is wrong, we believe, in both cases. The phthisis question was never thought of in connection with the strike till afterwards; a London paper, indeed, was the first to draw the inference; and in none of the speeches made by the strike leaders was there any attempt to drag in phthisis as a cause of the dispute. The files of the newspapers published at the time bear irrefutable testimony to that fact. Nor is *The Round Table* any nearer the mark in describing the lack of personal touch, compared with the pre-war period, between employer and employed as a contributory cause of the strike. It instances the absence of men like Sir Percy Fitzpatrick as proof of the changed condition of things in this respect. Yet how does the paper account for the fact that the strike extended even to cases like that of Mr. J. W. Quinn, "most famous of master bakers," where the personal contact between employer and employed was both direct and intimate. As a fact, the personal relation of employer to employed is no greater and no less to-day than ever it was on the mines; and the question, we believe, has nothing to do with the case. Nor were labour troubles wholly unknown before the war, and if *The Round Table* really wants to get at the causes of the trouble in July it need not go beyond the excellent report of the Rand Disturbances Commission.

* * * *

Vaal River Cold Fields, Ltd. It is announced that owing to the Vaal River Gold Fields, Ltd., having defaulted in the payment of interest on its debentures, the Oceana Development Company, Ltd., has secured the appointment of a receiver on behalf of the debenture-holders. There are £10,000 of ten per cent. debentures, of which £6,230 are issued. They were offered at par in July and December, 1912, and in September, 1913, and the interest is payable on January 31 and July 31. The Vaal River Gold Fields, Ltd., was formed in December, 1910, and has never paid a dividend.

TOPICS OF THE WEEK.

THE NEW INDUSTRIAL LEGISLATION.

The Assembly devoted the end of last week and the greater part of this to a debate on the second reading of Mr. Malan's Industrial Disputes and Trades Unions Bill. As the name implies, the Bill is an attempt to codify, clarify and improve upon the existing legislation dealing with industrial disputes; and the Minister of Mines has acted very wisely, we think, in securing for it precedence over all the other industrial legislation still waiting to be tackled. The first stages of the debate were, it must be frankly confessed, disappointing, mainly owing to the purely destructive attitude adopted by the Labour members. Mr. Malan, in introducing the Bill, dwelt with unexpected sympathy and understanding upon the claims of organized labour, and of the Trades Unions. The latter, he says, have come to stay in South Africa; and his Bill provides for their voluntary registration and recognition by employers while holding out certain inducements to secure that registration. Besides this, the chief point in the Bill is the machinery created to prevent industrial disputes, or, when they have occurred, to delay the outbreak of a strike until all peaceful methods for securing a settlement have been tried and exhausted. In times of peace a Conciliation Board is to consider and remove all likely causes of trouble; and when trouble does arise, methods are laid down along Canadian and English lines for arbitration, or failing that Government investigation into the questions at issue. Certain provisions are inserted in the Bill safeguarding the rights of non-Unionists, and preserving as far as is possible the liberty of minorities. But these features, it would seem, are too liberal for the growing intolerance of the Labour Party in the Assembly. These gentlemen, to the surprise of everybody, have not a single good word to say about the Bill. Their attitude is destructive, obstructionist and self-stultifying. They condemn the Bill, but they can suggest nothing better. Mr. Chaplin and Mr. Duncan showed the inconsistency in their attitude. Day in, day out, during the session, the Labour people have been declaring that the whole cause of the industrial unrest and strikes was the failure of the workers to secure constitutional redress or even attention to their grievances. Yet when the Minister of Mines does come forward with a measure, framed along the most modern democratic lines, investing organized labour with the same privileges as it has only won after years of agitation in older countries, the self-styled champions of the working man in the House have no word of help or encouragement, no constructive criticism to offer, nothing indeed to show but ridicule and cheap sneers. From that stupid and disappointing picture it is refreshing to turn to the attitude of Mr. Chaplin. We could understand Mr. Chaplin adopting an openly critical standpoint, and denouncing the unprecedented concessions made to Labour in the Bill. He knows, doubtless, that employers on the Rand are far from being united in regard to the wisdom of recognising Trades Unions, and the value of Conciliation Boards, Arbitration, and the whole paraphernalia of dealing with disputes now to be created by the Bill. He knows the unsettling influences of Trades Unions; their effect on the morale of the workers, which is now being diagnosed everywhere as one of their greatest concomitant evils. He likewise, better than most people, sees the difficulty of enforcing or "implementing" the awards and decisions of Conciliation and Arbitration Boards on the workmen. Despite all this, his attitude is sympathetic, helpful and constructive. He accepts the Bill, as an experiment in ameliorative legislation, a bold experiment, it is true, but one that in the interests of industrial peace deserves a trial. Unerringly he put his finger on the weak spots in the Bill, and his suggestions for attaining more certainly and directly the main objects of the measure will doubtless receive due consideration in the Committee stage. For instance, he indicated clearly the impossibility of enforcing any penalty on Unions breaking agreements in the absence of express provision, attaching in that event the offending Union's funds. He cordially endorsed Mr. Malan's reasons for refusing to recognise the right of that egregious, mischief-making body, the Federation of Trades, to intervene in all disputes. The good sense of the whole community is on the side of the Minister in that. There is room, of course, for considerable improvement to be made in the Bill by the Select Committee to which it has now been relegated. Some employers on the Rand regard the measure as investing the Unions with far too much power, and question the need for elaborating the existing machinery for dealing with disputes, which failed, they contend, in recent emergencies, less because of any inherent weakness than because it was not properly applied. The Labour members of the Assembly, on the other hand, in some undefined and unexplained way, regard the Bill as limiting and curbing the scope and power of the Trades Unions. The two opposing views may, after all, prove the best augury for the success of the measure as a mean between the extravagant desires of Labour extremists and the ultra conservative attitude of some old-fashioned employers.

THE SOUTH AFRICAN INSTITUTION OF ENGINEERS AND THE INDUSTRY.

The annual dinner of the South African Institution of Engineers last Saturday night brought together most of the best engineering talent on the Rand and provided the occasion for some notable speeches. Though the President, Mr. Wm. Calder, followed custom by confining his address mainly to the work and aims of the Institution, other speakers, notably Mr. W. Cullen, Mr. W. H. Dawe, Mr. A. E. A. Williamson, Mr. A. Richardson, Dr. Corstorphine, and Mr. E. Chappel, flung their nets wider and did not hesitate to discuss the burning topics of the day. The Deputy Mayor, Mr. Williamson, in a weak moment, allowed his discourse to be tinged with the pleasures of a grim and gentle melancholy, for which he was soundly rated by every succeeding speaker. Mr. Cullen, who followed, showed the strayed pessimist no mercy and had the temerity to include in his speech an unwonted surprise for Johannesburg—a tribute of praise for the leaders of the mining industry. From Mr. Cullen, of course, originality is always to be expected; and his speech embodied some valuable practical suggestions to the industry that, if not exactly new, certainly merit constant repetition. First, he is an out-and-out supporter of the justice of the plea for the removal of "the Colour Bar." He did not traverse the arguments in favour of the step, but it is plain that he subscribes to the case put forward fully and fairly in these columns for the reform. Again, he is out for the suppression at all costs of the illicit liquor traffic on the mines. He even goes so far as to advocate the adoption of what many people are pleased to regard as Mr. Schumacher's impracticable suggestion in regard to total prohibition for white and black alike. The remedy is, indeed, an heroic one; but we have sufficient faith in our fellow-man to believe that it is practicable. It only requires that the naked truth be brought home to the average man, that he be made to see the wholesale misery and overcrowding of gaols in the Transvaal, caused by this monstrous evil, and that it be demonstrated to him how voluntary total prohibition is the only effective cure. Stranger things than this have happened, that a whole community should voluntarily deny itself a luxury to remove such a blot upon humanity. In yet another respect is Mr. Cullen on the side of progress. He would like to see the research work now being undertaken by the S.A. Institute of Medical Research made the model of a research bureau for the whole Rand and for every problem of the industry. The passing of the Mines Trials Committee has left the way open for such an undertaking, and it ought not to be difficult to show that the industry would be amply repaid for the expense. Mr. Alex. Richardson, the energetic President of the Chemical, Metallurgical and Mining Society, supported Mr. Cullen's plea, and repeated a suggestion advanced by him, if we remember aright, at the last annual banquet of the Chemical Metallurgical and Mining Society, to the effect that the industry should send a deputation of specialists to the other mining fields of the world to see if there were anything they could teach us. Some day we hope to see Mr. Richardson's suggestion receive the consideration it deserves. But Mr. Dawe made, perhaps, the most important speech of the evening. He dealt in detail with allegations of victimization on the mines, made in the daily Press last week, and he nailed to the counter the many common and current lies in circulation. It may be that certain prominent agitators and disturbers of the peace are not wanted back in their old haunts. We do not know, but we should not be surprised if it were so. Between such a commonsense and obvious precautionary measure and the alleged wholesale victimization, there is, of course, a whole world of difference. Mr. Dawe, with transparent sincerity, gave the lie to these allegations: and no retorts from notorious "walking delegates" really affect the issue or detract a particle from the truth of his assurances. With the other important speeches made on this occasion it is impossible here to deal. Enough has been quoted, however, to show that this annual gathering of engineers is, if anything, growing in importance as the years go by, and that the addresses were of the thoughtful and thought-compelling nature we are wont to associate with meetings of the South African Institution of Engineers.

THE BUDGET AND THE MINING INDUSTRY.

The Union Budget presented by General Smuts for the current year is certainly good as far as it goes. The financial position of the Union, as disclosed by him, is satisfactory, and may be summarized in few figures. For the year 1913-14 the expenditure was £16,481,000 and the revenue £15,794,000, leaving a deficit of £687,000. This deficit has been practically met by an appropriation of £663,000 from the surplus of 1910-11. For the present financial year, the estimated net expenditure is £16,668,000 and the net revenue £15,707,000, leaving an estimated deficit of £961,000. This is to be met by an appropriation of £250,000 from the bewaarplaatsen fund; by readjusting the Customs tariff to produce an additional £200,000; by a graduated Income Tax on incomes over £1,000, which is estimated to yield £450,000; and finally by a land tax of 1d. in the £ on unimproved value of land (on estates below 10,000 morgen in extent or £10,000 in value), which is expected to give £50,000. In expounding these proposals General Smuts delivered an instructive and incisive review of the financial position of the Union. An interesting point he mentioned was, that owing to the fall in the price of diamonds, a conference, at which the German Government will be represented is to meet in June with a view to devising some means of producing greater stability in the diamond market. The Conference, we understand, will be held in London. Meanwhile, the fall in the prices is likely to influence the Union revenues rather seriously. The general progress of our external trade may be gathered from the fact that it has grown from 78 millions in the year preceding Union to 109 millions last year. The Minister believes we shall feel the effects of recent droughts and disturbances during the present year. Still, he said, "our difficulties and set-backs are generally surface movements." The development policy is bearing fruit, and General Smuts has "no feeling of pessimism." The Minister told how we had come to a definite point in our financial history. We have exhausted all expedients. Since Union the railways have contributed to general revenue £2,170,000 out of profits. That has gone, and the railways are no longer a taxing machine. Taxation has been remitted to the amount of £652,000. He, then, went on to show what heavy additional expenditure had been involved in the organisation of defence and in additional educational facilities. "It has become necessary," he said, "to look for other forms of taxation, for it is impossible for the normal increase of revenue year by year to make up for all this." The Minister made an important and reassuring reference to the Customs tariff. Briefly stated, General Smuts is no believer in high Protection. It would mean, he said, the building of industries at the coast on black labour. Such a policy would be opposed not merely on economic, but on national grounds. Furthermore, our primary production is not yet able to feed the country. We import foodstuffs to the value of nearly eight millions a year. Again, we have but a small market for our manufactures, and they must necessarily be produced at a higher cost. He quoted, too, the figures collected by the Economic Commission on the cost of living in Johannesburg. Here we have a town where the cost of food is higher than anywhere else in the world. Nevertheless, it is proposed to revise the Customs Tariff with a view to permanence in our Customs system, and the proceeds of the additional duties may be anything from £150,000 to £200,000. This, of course, would not bridge the gap. "We propose to do the right thing," he declared, "and go in boldly for an income tax." The tax, he explained, will begin at sixpence in the £ on incomes of over £1,000, and will be carefully graduated till it culminates in a tax of eighteenpence on the fortunate possessors of incomes of £24,000 or upwards. The farmers will pay income tax, "like any other man," said the General. There is, moreover, to be a tax on the unimproved value of land. The holders of large blocks of undeveloped lands will have to pay a penny in the £ on the unimproved value, but no owner in possession of land below ten thousand morgen in extent will have to pay. The tax will produce, it is expected, about £50,000. The Minister proceeded to outline a bold and progressive irrigation policy. The Government plans, summed up, amount to this—that during the next five years a sum of £3,500,000 will be expended in bringing under irrigation some 300,000 acres of land. A policy like that, said General Smuts, will mean a complete transformation of our internal resources, and he touched on its significance from the standpoint of land settlement and the problem of unemployment. In closing, General Smuts dealt with the position of the Union in regard to debt. At the date of Union the total debt was £117,000,000. To-day it is higher by £8,477,000. Since Union, debt has been redeemed to the amount of £4,848,000, which is equivalent to a redemption at the rate of one per cent. per annum. He pointed out that the debt per head of the South African Union is only £39 6s., whereas the Australian debt is £58 10s., and that of New Zealand £82. With the two chief novelties in the Budget, viz., the Land and Income Taxes, no one will quarrel except on the score of their limitation. The arguments used by General Smuts in favour of these taxes will doubtless be turned against him in future by the advocates of the more sweeping application of the principles involved. Until the details of the alterations in the Customs Tariff are available criticism under that head is premature. Otherwise the Budget for 1914-15 represents a courageous and statesmanlike attempt to put the finances of the country on a sound, permanent basis.

Labour and the Commercial Position.

It is noteworthy that the President of the Capetown Chamber of Commerce bears out Mr. Soutter's statements on the commercial position. Regarding the rapid recovery after last year's troubles—"the marvellous manner in which South Africa had emerged from a difficult period was," said Mr. Jagger, in his Presidential address, "striking evidence of the soundness of South African trade." Looking to the future, the Chamber's report states that the indications point to a further contraction of trade, and Mr. Jagger also is of opinion that the prospects do not point to such a prosperous year as the past three have been. But there is no reason, he added, to apprehend a serious set-back, and given good seasons—to which we may add, and freedom from the more extreme forms of industrial agitation—the country would soon recover. It may be hoped that the leaders of the labour movement will note the commercial set-back involved in the proceedings of the past year, and bear in mind that whatever tends to hamper and hinder the country's prosperity must necessarily make it all the more difficult for employers to better labour conditions.

PROGRESS OF TIN MINING IN THE TRANSVAAL.

Latest News from the Leading Properties—Zaaiplaats and Rietfontein—March Returns Examined.

Some interesting developments are on the tapis in regard to tin mining in the Transvaal. In the first place, we learn that the Zaaiplaats Company has acquired an interest in a portion of the farm Rietfontein, adjoining Rietfontein of the Transvaal Consolidated Land Company and the Welgevonden Tin Mine. A part of Rietfontein is owned and is now being exploited by the Harrisdale Syndicate. We understand that further capital is being provided for the opening up of the Van Rooyen's portion of Rietfontein, on which the Harrisdale Syndicate is operating, and that extensive developments are contemplated on this farm by the Harrisdale and Zaaiplaats Companies. We furthermore hear that recent developments in the Zaaiplaats mine have been eminently satisfactory. Attention may be directed to the fact that the output of base metals by the Transvaal mines in March was the largest on record, and it should be noted that the March tin output was no less than 389 tons of concentrates containing 64·55 per cent. of metal. Actual sales and shipments totalled 355 tons, of a value of £34,492. The low price that has obtained for tin of late has, of course, detrimentally affected the value of the aggregate production, but the output in point of tonnage must be adjudged very satisfactory and indicative of the great potentialities of the tin mining industry of this Province.

Increased Outputs Anticipated.

Unless water difficulties or acute shortage of labour are experienced during the coming dry season, it can, it seems, be fairly confidently assumed that the output of cassiterite will show further advancement during the next few months. Both the Leeuwpoort and Welgevonden mines, under African Farms control, are now productive, in addition to Rooiberg and Zaaiplaats, and it is anticipated that greater activity in the Oliphants River area will be evidenced during the coming winter months. In regard to the two African Farms subsidiaries, it should be remarked that a brief report for the quarter ended with March last has just been issued by the Leeuwpoort Company. The essential features of operations at that mine during the months of January, February and March are summed up in a cablegram despatched to London, which reads:—" For the quarter ended the 31st of March, 15 Californian and 2 Nissen stamps ran 86·12 days, milling 12,057 tons; tin concentrates produced, 213 long tons; metallic tin assay value, 62·28 per cent.; price realised per ton, £179 12s. 6d.; declared profit, £7,483 2s. 6d.; expenditure on capital account, £1,944 8s. 1d."

As to Welgevonden, it is rather curious to note that, whilst this concern declared an output in respect of the January operations, there has been no return given out as to the February or March results. We understand that the Board has not yet decided whether returns will be published monthly, quarterly or every six months.

Returns Tabulated.

Both the Rooiberg and Zaailplaats Companies earned net profits of about £4,000 each in respect of March operations, and the Swaziland Tin Company records an earning of £1,349. It may here be of interest to give in tabular form the essential features of production announced by the leading mines at the end of March:—

Company.	Days Milling.	Tons Milled. Tons (short).	Tin Concentrates Produced. Tons (long).	Metallic Tin, Assay Value of Concentrates.	Profit Declared.	Capital Expenditure
Leeuwpoort ...	86·12	12,057	213	62·28	7,483	1,944
Rooiberg	28·6	3,499	105	68·49	4,104	531
Swaziland Tin...	—	—	40·234	—	1,349	—
Zaaiplaats	27·8	3,786	100	66·3	3,919	401

In connection with the Rooiberg Company's returns, it should be pointed out that £2,529, expended on shaft sinking, exploration and development, etc., has been included in working expenditure for the month.

THE RAND'S DEEPEST MINES.

Low Working Costs—Factor of Depth of Comparative Minor Importance—Experiences of the Village Deep and Simmer Deep.

The Village Deep mine at the end of the year had been opened up to a depth of nearly 200 feet below the plane of the 21st level. At the present time a maximum working depth of about 4,500 feet has been reached in this property, the depth of the Turf Mines shaft being 4,200 feet, and the work carried out below the bottom of this shaft representing in vertical depth a further 300 feet.

Some Ultra-Deep Mines.

The Village Deep is thus the deepest mine at work on the Central Witwatersrand, and now that operations in the Jupiter and Cinderella Consolidated have been suspended, it is the second deepest proposition of the Main Reef series, the Simmer Deep holding pride of place in this regard. The deepest of all the mines on the Rand, whether working or idle, is the Jupiter, where a vertical depth of well over 5,000 feet has been reached. The Jupiter and the New Chum Railway Mine, in the State of Victoria, are thus, in all probability, the deepest gold mines in the world.

Questions of Values and Costs.

The closing down of the Jupiter and Cinderella Consolidated has, of course, been seized upon as evidence of the oft-repeated statement that gold values contained in Witwatersrand mines deteriorate as greater depth is reached. Without again discussing the various controversial aspects of this view, it may be pointed out that both the Cinderella and the Jupiter are situated on the deep level sections of poor outcrop areas of the Witwatersrand. In regard to the Village Deep, we learn that developments there are proceeding in a thoroughly satisfactory manner and that the values disclosed in the deeper levels are quite good. In the earlier days of these fields, when the flotation of deep level properties was inaugurated, it was repeatedly urged that the increased depth of working would be attended by higher operating costs, and in fact that working expenses would increase in more or less direct ratio to the increase in working depth. One of the principal difficulties which it was in those days supposed would militate against working at great depth was the hoisting of ore and the lowering and hoisting of men and tools. The late Major Seymour gave this matter most exhaustive consideration, and the noteworthy papers read by Messrs. Hennen Jennings, Hans Behr, A. M. Robeson and E. J. Laschinger before the Institution of Mining and Metallurgy on "Hoisting from Great Depths" will still be comparatively fresh in the memories of many of our technical readers.

Hoisting Problems.

Pumping it was considered would not present any serious difficulties, and although it was rightly deemed there would be increasing loss in transmission of compressed air as greater depths were reached it was not thought that the operation of underground rock drills either would present many obstacles. It is in connection with hoisting and lowering that difficulties which a dozen years ago were regarded as very serious have been most easily brushed aside. Electric stage hoisting has rendered raising of rock from a depth of about three-quarters of a mile surprisingly easy, and it is very evident to-day that the scale of working and whether sufficient or insufficient labour is available are the factors that determine the cost of working rather than the depth at which ore winning operations are conducted.

Scale of Working the Chief Factor.

To return to the Village Deep in illustration of this statement, it may be pointed out that the cost of operation on the basis of a ton milled for this proposition in March was 15s. 7d. per ton, exclusive of development charges, or with development costs 17s. 2d., as against an average of 17s. 3d. for the whole Witwatersrand. The statistics relative to the Simmer Deep Company's operations in March bring out the point even more clearly. At this mine the total cost of working, including development or development redemption charges was 14s. 3d. per ton, or 3s. per ton below the average for the whole field. These figures certainly entitle one to be hopeful as to the probable results of working banket down to a depth of 7,500 feet, provided circumstances in regard to labour, etc., are favourable to operation on a large scale, and that healthy working conditions can be maintained down to this depth.

THE MINING SITUATION IN RHODESIA.

March Return Creates a Further Record—The 1914 Output Anticipated—Position at New Producers.

The returns of mineral production from Matabeleland and Mashonaland for the past two months have made it clear that the output of Southern Rhodesia for the current year will constitute a very material increase over the output of 1913. This view has been stated in the columns of the *South African Mining Journal* frequently during the past eighteen months, but mining in Charterland has been of such a chequered nature up to the present that no doubt many critics regard prediction as a very different thing to achievement, and we therefore return without apology to a brief consideration of the present position and immediate prospects of the mineral industry of our northern neighbours.

March Return, £291,440.

With an output valued at £291,440 for the month of March, Rhodesia may certainly survey the situation with far more serenity than ever hitherto. Investors in the mines of that country have long since grown tired of promises, and it is therefore most gratifying to find that the March output is the largest ever recorded. As in the Transvaal, the gold mines have borne the major share of this contribution to the wealth of the world, the production of the precious metal having a value of £273,403 as compared with £259,722 in February of this year and £257,797 in March of 1913. It will be of interest to analyse this production according to districts and also to note the essential features connected with the leading mines. The total of £273,403 is made up according to districts as follows:—

	Ozs.	
Bulawayo district ...	17,787·85	£74,700
Gwelo district	18,117·88	76,115
Hartley district . ..	13,051·21	55,097
Lomagundi district ...	2,559·35	10,837
Mazoe district	3,223·22	13,628
Salisbury district	4,798·29	20,286
Umtali district .	4,495·65	18,958
Victoria district . . .	900·13	3,782
Total ..	64,936·91	£273,403

It should be noted that the Hartley total does not include the production at the Cam and Motor. An official statement was made some time ago that, owing to March being a broken month, the output for the period of that month will be incorporated in the returns for April. The Bell makes its first appearance in the list with an output of 738·11 ozs. from 1,911 tons. The Yankee Doodle (now under tribute) again makes its appearance with outputs of 282·03 ozs. from 1,576 tons milled, and 146 ozs. from 910 tons of sands. The Globe and Phoenix roasting plant has been re-started and the total output from the mine is 8,988 ozs. The Shamva crushed 31,855 in 22 days, the return from the mill being 1,680 ozs., from sands 535, and from slimes 1,133.

An Anticipation.

Clearly neither the Shamva nor the Cam and Motor have yet got into their full strides, and as better returns are to be expected from the Bell and one or two other of the older established mines in the near future, a monthly output of about 80,000 ozs. seems not unreasonable to hope for. The increased returns of the last month or two certainly seem to indicate a fulfilment of the anticipations expressed some little while ago in regard to the 1914 gold harvest of Matabeleland and Mashonaland. At the beginning of the year it was written in the *Rhodesian Mining Review*:—"Turning to the general prospects of the output for 1914, it is not difficult to forecast the date when a figure some 20,000 ozs. in advance of the present rate of return will be declared. The present yield is some 58,000 ozs. per month, and to this we may expect, in the next few months, the following additions: Antelope, 1,100 ozs.; Bell, 2,000 ozs.; Cam and Motor, 7,500 ozs.; Shamva, 12,000 ozs.; Falcon, 3,000 ozs.; total, 25,600 ozs. This addition to the present output would give a monthly total of 83,000 ozs. before the end of the current year, and it will be seen that the entry of these mines into the producing list will have a most important bearing upon the status of the mining industry generally." This anticipation now certainly looks to be capable of realisation in the very near future, and that increased attention is bound as a result to be attracted to Rhodesia, a country which has for so long been in the doldrums, cannot very well be doubted.

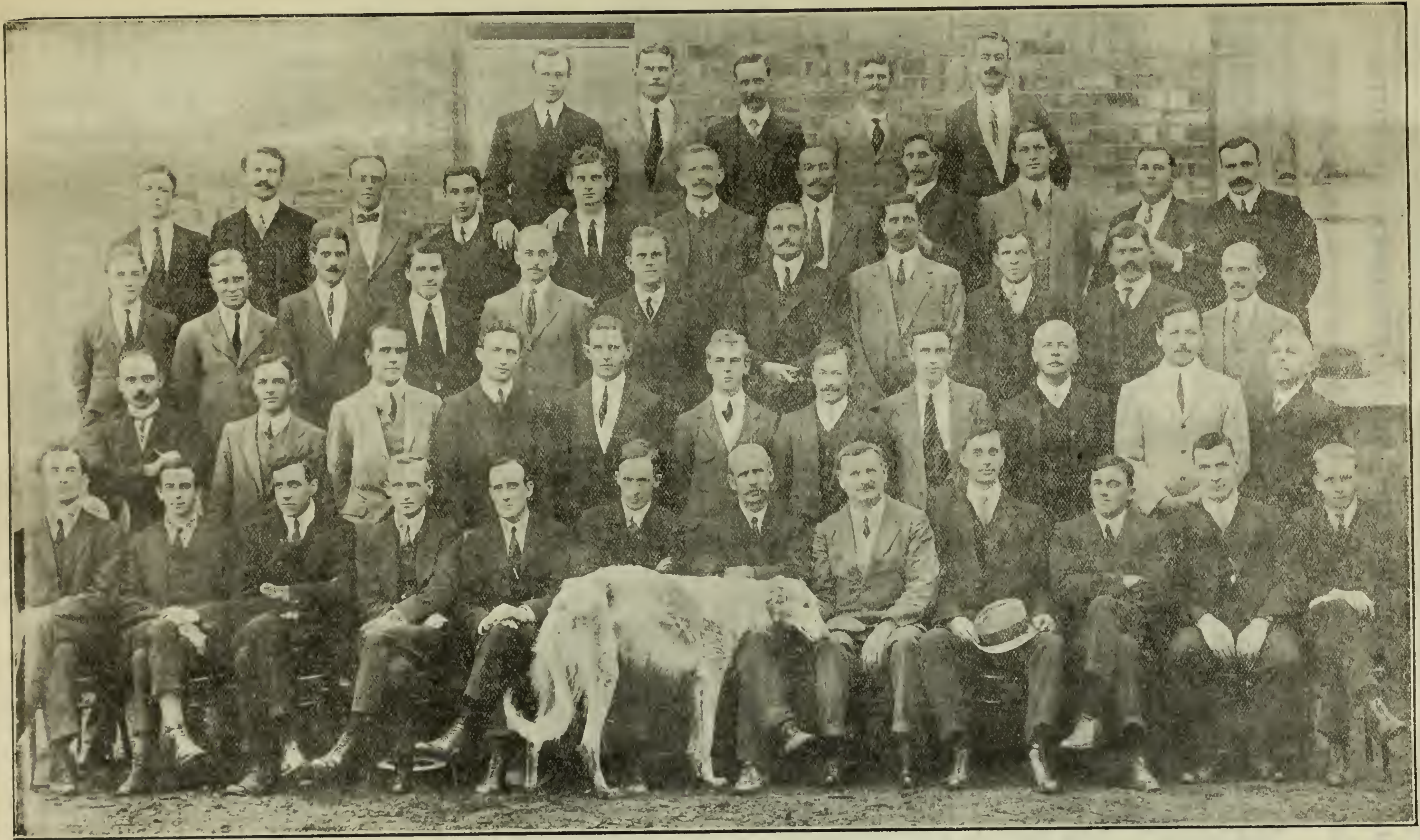
Coal and Base Metals.

As to minerals other than gold, interest at the present centres in the Wankie Colliery Company, which has recently concluded an important agreement with the Union Minière du Haut Katanga for the supply of the great Belgian company's fuel requirements, and in the Victoria district, where development of asbestos and chrome iron ore deposits on a large scale is promised. It should here prove of interest to record the production of minerals and metals other than gold in Rhodesia last month. These were:—

Silver (ozs.)	11,338·11	£1,131
Chrome Iron (tons) ...	3,097·92	6,915
Lead	16·19	269
Diamonds (carats)	90·25	383
Coal (tons)	26,389	9,336

Assuredly Rhodesia appears to be forging ahead in regard to mineral activity, and unless the present favourable outlook is seized as meet opportunity for the flotation of wild-cat schemes, the country should enjoy more prosperity than has fallen to its lot for several years past.

THE MANAGER AND STAFF OF THE SIMMER DEEP, LTD.



Bottom Row (left to right): C. Southwood, mine captain; D. M. Ferguson, mine captain; C. Y. Bruce, mine captain; F. A. Hiscock, resident secretary; T. A. Malpage, underground manager; H. S. Macgregor, manager; H. McLean, resident engineer; J. E. Thomas, reduction works manager; W. B. Marshall, assistant native timekeeper; W. R. Cousens, shiftboss; T. Hall, shiftboss; W. J. Wilkins, assistant native timekeeper.

Second Row (left to right): J. F. Bond, statistician; A. L. Greenway, assistant native timekeeper; E. H. Becker, assistant sampler; H. R. Lederle, acting native timekeeper: P. C. de Maine, reduction works manager's clerk; W. P. Stranger, white timekeeper; J. E. Chick, assistant storekeeper; E. Bower, assistant surveyor: A. Melvill, assistant storekeeper; A. E. Neale, assistant native timekeeper; J. S. Melvill, mine captain's clerk.

Third Row (left to right): W. Beaton, assistant native timekeeper; E. A. Osterloh, cyanide foreman; F. Humphreys, surveyor; W. Mathey, assistant sampler; J. Aling, assistant sampler; F. W. Pickard, acting sampler; G. R. Chaplin, chief electrician; W. Martin, assistant engineer; A. Palmer, assistant sampler; W. H. Jane, mill foreman; N. M. Blyth, assistant timekeeper.

Fourth Row (left to right): E. C. East, assistant sampler; G. Hauptfleisch, assistant sampler; H. G. Mountain, assistant surveyor; J. Sandoe, assistant surveyor; F. A. Strofield, assistant sampler; W. S. Whaley, mill shiftboss; W. G. Inglis, mill shiftboss; L. Oubourg, mill shiftboss; J. Reynecke, shiftboss; T. Smerdon, storekeeper; A. C. J. Fowler, shiftboss.

Fifth Row (left to right): W. S. Skinner, assistant sampler; A. N. Stuart, smelter; F. A. Westfield, cyanide shiftboss; A. C. Adams, cyanide shiftboss; W. M. Butler, cyanide shiftboss.

Olliver, Photo.

THE RAND'S ORE RESERVES: SOME FURTHER ASPECTS.

What the £155,000,000 Means to South Africa—The Share of Labour and the Merchant.

In the preceding issue we published a table showing the ore reserves contained in the gold mines of the Witwatersrand as at December 31st last, or near date. It may be recalled that a grand total of ninety-two and a half million tons was arrived at, or with ore partially developed or partially valued, the great bulk of which may be assumed to be payable, and in addition the tonnages of "pay" rock awaiting mining in a few comparatively unimportant mines not included in the above, a grand total of about one hundred and fifteen million tons. Furthermore, it was assumed that this tonnage contains gold of a total recoverable value amounting to about £155,000,000. The subject of ore reserves is of such supreme importance that we here propose to devote some further space to a consideration of these reserves, their value, and their significance for employees, merchants, the investing public, and the community of South Africa at large.

Allocation of the Millions.

In the first place it may be asked "How will the one hundred and fifty-five million pounds contained in these reserves be divided; in other words, how much of this vast sum will accrue to shareholders and how much will be absorbed in working expenditure and distributed amongst the people of the country?" In our last issue we stated that we did not then propose to venture an analysis in hard and fast figures as to what this vast tonnage of ore—this enormous stock-in-trade of the industry—may mean to the shareholders, individuals, or to the country in working costs. Admitting that any very precise calculations are inadvisable, if not, indeed, impossible, we nevertheless may here submit a few figures as to the probable allocation of the gold contents of this tonnage, rather with a view to indicating the immense importance of the ore reserves of the Main Reef series than of submitting any data of exact statistical value. The figures given hereunder are necessarily approximate, and we would again employ the words used last week as a qualification of the figures relating to the distributable value of the ore reserves. In our previous issue we remarked that whilst the accumulation of such a colossal tonnage of profitable ore ready for stoping obviously makes for industrial stability, it must be recognised that the Rand is still largely at the mercy of legislation, labour difficulties, and a thousand and one other factors. It must be clear that any movement in working costs must be reflected very clearly in ore reserve totals and values. Thus an increase in working expenditure would not only decrease the profitable value of the reserves in question, but it would also place large tonnages beyond the pale of profitable working altogether, or would at any rate postpone the date at which these tonnages could be worked at a profit. Similarly a decline in working expense would increase the profitable value of the ore reserves and would at the same time bring large tonnages of low grade ore, at present incapable of profitable working, within the borders of "payability." Subject to a full appreciation of these facts, the following tentative calculations should prove of interest.

Proportion of Wages and Stores.

In the first place the amount locked up in the ore reserves in working expenditure may be considered. These working costs may be divided into (a) salaries and wages to white and coloured employees, and (b) payments in respect of stores and machinery, etc. From the Mines Department report for the year ended with 31st December, 1912, we arrive at the facts that in that year salaries and wages claimed approximately 36 per cent. of the total gold production, and machinery and stores 27 per cent. Applying these figures to the £155,000,000 estimated to be contained in the Rand's developed and profitable ore reserves, the following calculations may be arrived at:—

Amount estimated to be contained in the reserves, representative of salaries and wages, on a basis of 36 per cent.	£55,800,000
Amount estimated to be contained in the reserves, representative of machinery and stores, on a basis of 27 per cent.	£41,850,000

This accounts for a total of £97,650,000 out of the £155,000,000 estimated contained value of the total reserves.

Shareholders' and Government's Share.

Last year the gold produced by the mines of the Witwatersrand had a total value of £35,812,605, and of this £8,194,099 were distributed in dividends, or, say, 23 per cent. This represents £35,650,000, on the basis of £155,000,000. The remaining 14 per cent., or £21,700,000 may be taken to represent the amount that will be payable to the Government in the form of profits tax and the other taxation to which the industry is subjected, such as, for example, phthisis compensation, interest on debentures, etc. It should be clear from the above that the profitable working of these reserves means a tremendous amount to South Africa. It should be observed that amounts estimated to be distributed in South Africa in one direction or the other come to the enormous total of £119,350,000. The figures speak for themselves. It should be quite unnecessary to venture any further remarks in support of our contention that the Rand's ore reserves represent the life-blood of the industry, or, to vary the metaphor, the stock-in-trade and credit of South Africa. On the realization of their contained values the future prosperity of the Union largely depends.

Van Ryn Estate.

In the House of Assembly on Tuesday last, Mr. Madeley (Springs) asked the Minister of Mines: (1) Whether it was a fact that on the Van Ryn Estate the mill engines, cyanide motors and boilers were run and superintended by Indians at 5s. per day of 12 hours; (2) when changing shifts at the week-end, did these Indians work 18 hours continuously; (3) was it a fact that in at least one hauling engine-room there was no one in attendance from 4 p.m. to 7 a.m., the engine-driver being absolutely alone; (4) was the Minister aware that compound and hospital roofs were recently painted by Cape boys at 2s. a day, and the mill engine-room, battery, crusher, and cyanide by Kafirs at 1s. 6d. a day; (5) was it a fact that at another hauling engine-room on the property the boiler gauge glasses were placed in view of engine-drivers, and the responsible white boiler attendant dispensed with? The Minister, in reply to the first point in the question, answered in the negative. Respecting the other points, the reply was in the affirmative; and the Minister added that the practice referred to in No. 5 was not dangerous.

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of March, 1914, was as follows:—Reef: Mill: Gold won (fine), 432 ozs. 7 dwts. 9 grains; tons treated, 1,003; value, £1,815 16s. 9d. Concentrates (estimated): Gold (fine), 18 ozs. 14 dwts. 19 grains; tons, 10; value, £79 12s. 11d.; also contains silver and lead, value £45 19s. 4d. Cyanide: Gold recovered (fine), 8 ozs. 5 dwts. 10 grains; tons treated, 36; value, £34 14s. 6d. Alluvial: Gold recovered (fine), 1,574 ozs. 6 dwts. 10 grains; cubic metres treated, 101,010; value, £6,612 2s. 6d.

RELATION OF GEOLOGY TO MINING.*—II.

A Review of the Debt Mining on the Rand and Elsewhere Owes to Geology.

[By F. H. HATCH.]

THE following is the continuation of the article on "Relation of Geology to Mining":—

The limited time at my disposal will not allow me to recapitulate more than a few of the important services rendered in recent years to mining by geologists. But mention must be made of E. J. Dunn's survey of the Bendigo goldfields and his brilliant exposition of the true nature of the remarkable saddle-reefs, whose tectonic structure has determined a type of mine development quite peculiar to that field. Again, S. F. Emmons' monograph on the structure and genesis of the Leadville silver-lead ores has been of enormous value to the Colorado miners, not a few of whom owe their success on that field to the predictions of the distinguished economic geologist whose recent demise we must all deplore. On the other hand, the theory advocated by Emmons that the ores were derived from metals leached from the overlying porphyries and the consequent conclusion that the lower or white limestone would prove unproductive, have probably somewhat retarded the deeper development of the district. These lower horizons have since proved to be very productive, as will be shown in the new edition of the Leadville Monograph now in course of preparation.† Emmons' researches on the deposits of silver-lead ore in limestone at Leadville incidentally led him to develop the theory of metasomatism, or replacement, as a prime factor in the genesis of ore deposits. Another worker in the same field, and, moreover, a friend of Emmons and long a colleagues on the United States Geological Survey, is George F. Becker, whose classical studies on the famous Comstock lode and its high-temperature thermal springs have done so much to demonstrate the close genetic connection between ore-deposition and vulcanicity. Becker's monograph on the geology of the Comstock lode was issued in 1882, and in one of the opening chapters he pays a remarkable tribute to Baron Ferdinand von Richthofen, who examined the Comstock in 1865 for the Sutro Tunnel Company, at that time engaged in driving a deep level adit to the lode at a depth over 1,000 feet vertical below the then existing workings. The German geologist had a keen insight into structure, and although the mines were, when Becker wrote, about six times as deep as they were at the date of Von Richtofen's report, the later investigator states that the opinions and predictions of his predecessor as to the behaviour of the lode in depth had been verified in a very remarkable manner. The United States not only is rich in great natural repositories of mineral wealth, but is fortunate in its economic geologists, whose keen observation and powers of deductive reasoning are admirably adapted to the study of their structure and genesis. That this is no idle saying witness the splendid series of monographs and professional papers issued by the United States Geological Survey. I have referred to the work of Emmons and Becker; there are many others. To mention a few only: R. D. Irving, who wrote on the Copper-bearing Rocks of Lake Superior; Lindgren, on the Copper Deposits of the Clifton Morenci District, Arizona; Weed, on the Geology and Ore-deposits of the Butte District, Montana; Lindgren and Ransome, on the Geology and Gold Deposits of the Cripple Creek District, Colorado; Van Hise and Leith, on the Iron-Ore Deposits of Lake Superior. Willet G. Miller's work on the Cobalt Silver District also deserves mention. His description of the characteristic features of the silver veins right at the beginning of the mining operations of that camp was of first importance; and his early recognition of the bearing of the Keewatin Series, which underlies the Cobalt conglomerates, on the life of the mines exercised a salutary chastening influence on the exaggerated optimism of those engaged in the early development of that field. Hitherto I have confined my remarks to lode-mining; but in the field of alluvial mining the economic geologist has also something to say. The fascinating task of tracing out, first by boring and then by drifting, the auriferous gravels of an ancient river-system, deeply buried under a pile of more recent accumulations, which sometimes even include thick sheets of basaltic lava as in the Loddon Valley at Ballarat, must have called for considerable geological acumen. I am unaware to whom the credit for the first discoveries of this nature in Australia and California is due, but I cannot forbear to mention Mr. Lindgren's remarkable reconstruction of the ancient (Tertiary) topography in the vicinity of Nevada City and Grass Valley in California. The map on which this work is recorded (the Tertiary configuration by heavy lines and the present contours by faint lines) clearly shows the ancient valleys with their tributary streams usually running at right-angles to the present drainage lines. The assistance rendered by geologists in prospecting for petroleum is well known to you. The earliest investigations of petroleum fields, dating back to the middle of last century, led to the conclusion that great natural reservoirs of oil and gas tend to form along the axes of anticlinal folds or at the top of domes; it was also observed that the best conditions for oil accumulation were those of gentle folding, sufficient indeed to give a gradient along which the oil and gas could travel in the porous bed, but not intense enough to cause fissuring in the impermeable cover.‡ It must be conceded that the general correctness of this theory has been confirmed by the work of subsequent observers, and it will also be noted that the "anticlinal theory" is not quite as novel a conception as some of our friends would have us believe. There can be no doubt that the search for these natural products is essentially a geological problem, and, to my mind, the fundamental qualifications for what is euphemistically termed "the oil expert"§ are sound geology and common sense. I shall refer later on to the important bearing on mining—especially on the mining of copper—of the researches of mining geologists on the origin of ore-deposits, and notably in regard to the phenomenon of secondary enrichment.

(To be continued.)

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*Abstract of Presidential address delivered before the Institution of Mining and Metallurgy.

†"The Ore Deposits of the Leadville District: Written with the aid of the Field Notes and Memoranda of the late S. F. Emmons" By J. D. Irving. 1914.

‡Sterry Hunt: "Geology of Canada," pp. 522-525, and contributions to the "Chemical and Geological History of Bitumens," "American Journal of Science," Vol. XXXV., 1863, p. 157. Höfer: "Petroleum Industrie Nordamerikas," 1877, p. 81. Also "Econ. Geol.," Vol. V., 1910, p. 492.

§I note that in America the term "geological engineer" is coming into fashion in connection with this department of work.

S.W. Transvaal Diamond Diggings.

The March returns of diamonds found throughout the South-Western Transvaal show a total of 3,865¼ carats, value £18,159, as compared with 3,838⅜ carats, value £16,167 2s. 6d., in February, and 3,063¾ carats, value £12,348 5s., in January. There were again 39 areas contributing to the total, and a summary of these and their output is as follows:

	Carats.	*Value.*
Cawood's Hope	438¼	£2,898 19 0
Bloemhof	647½	2,707 16 0
London	521	2,465 10 0
Panfontein	560½	1,842 19 6
Dievedraai	342⅞	1,701 12 6
Eastleigh	247¼	1,283 15 0
Kareepan 164	194½	1,272 5 0
Rondevlei and Doornbult	176¾	908 2 6
Koppiesvlei	111¾	462 15 0
Eerstebegin	59¾	323 0 0
Avondster	92¾	317 12 0
Kameelkuil	78⅜	315 15 0
Mooifontein	58¾	254 17 6
Modderkraal	46¾	200 5 0
Schweizer Reneke	45¼	173 10 0
Rietput	26	139 0 0
Christiana	26¼	131 15 0
Olivenfontein	26¼	124 15 0
Kromellenboog	17½	91 2 6
Diamantdoorns	20¼	85 10 0
Maroetjesfontein	24	84 10 0
Goedgenoeg	14½	61 0 0
Zevenfontein	16½	59 0 0
Vogelstruiskuil	14¼	56 0 0
Johannesrust	4¼	43 0 0
Weltevreden	13	33 14 0
Mamusa	7	23 0 0
Boschplaats	3¾	21 2 6
Baviaanskrans	4½	17 0 0
Leeuwbosch	3¾	13 0 0
Homansvlei	6	13 0 0
Grootpoort	3¼	10 10 0
Kareepan 137	6¼	10 5 0
Grootdoorns	1¼	5 0 0
Van Zyl's Drift	2½	4 10 0
Zoetfontein	¾	2 0 0
Kuilfontein	¾	1 0 0
Doornbult	¼	0 10 0
Blesbokfontein	¼	0 2 0
	3,865¼	£18,159 0 0

Roberts Victor Diamonds.

Washing was resumed at the Roberts Victor mine on the 2nd March, and the results up to the 31st of that month are as follows:—Loads washed, 18,556; carats recovered, 5,324.

GEOLOGICAL FEATURES OF THE CENTRAL CONGO.

Mineral Discoveries on the Equator—An Interesting Paper.

In the transactions of the Institute of Mining and Metallurgy to hand by this mail there is an interesting description of a portion of equatorial Africa from the pen of Mr. Henry W. Hill, A.I.M.M. Mr. Hill deals briefly with the physiography but more particularly with the geology of the Central Congo Free State region, and his work in regard to the petrological and stratigraphical features of the country constitutes a valuable supplement to and continuation of the investigations of Mr. Studt in the country further to the south. In the course of his contribution Mr. Hill writes:—

At Ponthierville, about 100 km. up the river from Stanleyville, granite and gabbro come to the surface over small areas in this vast sandstone country. The granite is intersected by small dykes consisting chiefly of hornblende syenite. A copper deposit occurs in the granite, striking approximately N. and S. and dipping 80° W. The vein filling is chiefly of quartz, though a small thickness of hornblende occurs near the footwall. The ore in parts is a dense siliceous breccia, containing fragments of granite, quartzchert, and horneblende. The copper, chiefly chalcocite, occurs as veins, blotches, and spots in short lenses. Stringers of chalcocite occur also in the hornblende. The deposit has so far been opened for a length of 300 feet and the ore broken out to a depth of 10 feet. On the east wall the granite is fine-grained with very little mica; on the west wall, copper occurs also in the granite, pockets of ore having been picked out some eight or ten feet away from the vein proper. Some 50 feet west of the ore deposit a dyke of hornblende syenite occurs, in which occasional spots of chalcocite are found. I was not able to determine the right trend of this dyke, as it was exposed only for a short distance in the creek, but it would appear to be the source whence the copper was derived at the time of the fissuring of the granite, and it must therefore at some point be connected with the ore shoot. Although the granite on the east wall appears so dense and undisturbed, yet at a point about 100 ft. east of the vein a blue carbonate stringer about 3 in. thick occurred upon which a hole was put down. About 3 ft. below the surface a piece of malleable copper weighing about 100 lb. was discovered in soft rock. To follow this, prospecting was undertaken, but nothing further was discovered; even the carbonate streak disappeared without leaving anything to follow. Some 5 km. to the north-west bituminous shale was discovered, but at the time of my visit two years ago no work had been done. The formation, 5 ft. thick, was exposed in the bank of a creek, and was seen to lie horizontally over a blue clay-sandstone and to be covered by two to three feet of clay. This deposit has since been explored, and I have been officially informed that an extensive occurrence has been proved by shafts and boring which, it is reported, contains 800 lb. of oil to the ton. At Stanleyville an extent of hard coarse sandstone is found. Eighty km. to the east there is a small boss of hornblende granite, excepting which the whole country for 300 km. east in this direction is sandstone. This rock is chiefly red, massive and silicified, but brown sandstone and yellowish friable sandstone also occur. In two places I saw small occurrences of dark laminated argillaceous sandstone with slaty bedding. The sandstone adjacent to the eruptive rocks showed no metamorphism as far as I could see. Throughout this vast area the country is covered by sandy loam or clay in which it is but rarely that any rocks outcrop. In the immediate vicinity of long. 28° E. a change occurs, and blue silicified sandstone becomes prominent, with clay sandstone and small beds of slate changing into chert. Further east flints and cherty quartzose rocks cover an extent of about 15 km., reaching a point about 30 km. east of long. 28°. Here the eruptive rocks commence which form the western slope of the range traversing the greater part of Africa in a northerly and southerly direction. In an easterly direction, granite with dykes of hornblende syenite come first for about 15 km., succeeded by hornblende syenite with granite dykes which bring the total to about 60 km. At this point a vast area of micaceous schist commences, in which hornblende syenite occurs as bosses or dykes. To the east of this for a width of about 15 km. greenstone occurs, in which term are induced diorite, amphibolite, soft hornblende and chloritic rocks, some of which are schistose. Outcrops of quartz and quartzite are scattered throughout. Gold is found in the creeks and in the gravel of most of the valleys. Some of the chloritic schist shows iron pyrites much oxidised. A similar belt of greenstone rocks occur about 80 km. further south, where it is about 10 km. wide in an east and west direction, granite occurring in the western portion and massive hornblendic rock in the east. The belt widens out in a southerly direction, and there is little doubt that it represents a continuation of that found to the north. Reverting to that belt, in the neighbourhood of lat. 1° N., it has in its eastern portion an irregular area of massive fine-grained sandstone, with hard quartz and granite pebbles widely scattered. The same formation occurs again about 70 km. to the south-west in the neighbourhood of the Ibina River, whence I followed it for 60 km. to the north, where it changes into coarse conglomerate sandstone, and this appears to be the northern limit of this sandstone. It extends, however, to the east in a somewhat circuitous course to about long. 30 E., where black, dark, and grey coloured shales, slates and argillaceous sandstone are found, and where this formation appears to abut upon a strong granite range. The width north and south of the sandstone probably does not exceed 20 km., the adjoining rocks being granite and coarse-grained hornblende. Although the Semliki valley is mostly covered by alluvium there is sandstone beneath, which is from 5 to 30 km. wide in parts along the valley. The river between Lake Albert Edward and Lake Albert divides two massive ranges which form part of the great range of Africa. The predominating rocks are eruptive, hornblende syenite, granite porphyry and felsite being found; small diorite dykes also occur at long intervals.

The paper is of very considerable interest and value, but without in any way detracting from its importance we must say we think that the paper as a whole would occupy a more appropriate place in the Journal of the Royal Geographical Society than in the Transactions of the Institute of Mining and Metallurgy.

THE ECONOMICS OF VOORSPOED MINE OPERATIONS.

Detailed Review of the Cost of Re-equipping and Working the Property—Finding of the Government Commission of Enquiry.

The detailed finding of the Commission of Enquiry into the Voorspoed Mine, a summary of which we gave last week, is as follows:—

The following finding of the Board, appointed under section fifty-two of the Mining of Precious Stones Ordinance, No. 4 of 1904, of the Orange River Colony, to decide whether the bona fide mining and working expenses of the Voorspoed Diamond Mine, situated in the Kroonstad district of the Orange Free State, cannot be met by the sale of the precious stones found therein when realised at the true and fair market value, is published for general information.

FINDING.

This Board was constituted in March, 1914, under section fifty two of the Mining of Precious Stones Ordinance, 1904, of the Orange River Colony, to inquire and decide whether "the bona fide mining and working expenses of the Voorspoed Diamond Mine cannot be met by the sale of the precious stones found therein when realised at their true and fair market value." The first sitting of the Board was held at Kroonstad on 27th March, 1914, and on the same day an inspection of the mine was made by the members. The Board was informed at Kroonstad that sufficient notice had not been given to enable residents in the district to attend as witnesses, and in consequence of this intimation provision was made for any such witnesses to give evidence at Johannesburg free of expense to themselves. Subsequently the Board heard evidence at Johannesburg on the 7th, 8th and 9th April, 1914, on behalf of the De Beers Company—the present owner of the mine—and the Crown. As the previous owner of the mine—the Voorspoed Diamond Mining Company—had, after several years' working, suspended operations without obtaining the consent of the Head of the Mines Department, as provided in section fifty-one of the Ordinance, the Board, after hearing counsel, held that the onus of establishing the non payability of the mine was on the present owner. The future life of the mine was taken by both parties to be represented by six million loads. It was also accepted that £35,000 would be required to re-equip the mine, and this sum the Crown admitted would have to be deducted from any estimated profit or added to any estimated loss, as the case might be. The De Beers Company further claimed that the cost, or at all events the value of the existing plant, should similarly be deducted or added; but the Board was of opinion that on a true construction of the Ordinance, such expenditure on plant was not a mining and working expense within the meaning of section fifty-one. The final conclusion of the Board obviously depends on the views taken regarding (1) future working costs, (2) yield of diamonds, and (3) price to be realised for the stones won, and to these questions the evidence was mainly directed.

(1) WORKING COSTS.

On behalf of the Crown these were put at 2s. 4d. per load, while the expert witnesses for the De Beers Company placed them at 2s. 7¾d., 2s. 9d., and 2s. 10d. respectively. The Crown's estimate was based on a saving, due to improved machinery, of 4d. on the cost incurred by the Voorspoed Company, which was taken at 2s. 8d. per load. But this estimate is open to objection, not merely because it attributes to the improved plant a considerably greater saving in costs than either the evidence generally would warrant or than would appear to be reasonable, but also because it makes no allowance for extra cost in working a mine at the close of its life at increased depth and very little allowance for maintenance and repairs. It was also claimed that the working costs of the Voorspoed Company were increased by extravagant and unnecessary expenditure on certain items, such as coal, labour recruiting, and legal expenses, totalling approximately £18,000, and uncontradicted evidence in support of this was given. But, assuming the whole of this sum could be saved in the future, the effect on the working costs, spread over the life of the mine, would not be appreciable, and could not influence in any material degree the estimate to be formed of the working costs per load. For the purpose of its decision, the Board has taken the costs at 2s. 6d. per load, which certainly, in view of the detailed evidence given by experienced mine managers, cannot be regarded as an excessive estimate.

(2) YIELD OF DIAMONDS.

This was estimated by the witnesses for the De Beers Company at 12 and 13 carats respectively per 100 loads. No estimate in caratage was given by the Crown witnesses, but an estimate of "an equivalent value" of 15 carats was furnished by them. Excluding the first year's working of the mine, which was confined to rich yellow ground, the average yield of the mine during the remaining period of working was 13·94 carats. The average during the seven months of the last year it was worked was 12·61 carats. It was generally accepted that an improvement in the crushing and washing plant would result in catching small diamonds which had previously been lost, and thus increase the yield, and for this an allowance was made by the witnesses for the De Beers Company. There was no satisfactory evidence on which to form an opinion as to whether there would be an increase or decrease in the quality of the stones to be recovered. On the whole the Board considers that a fair, although perhaps somewhat liberal, estimate of the yield would be 14 carats per 100 loads.

(3) PRICE TO BE REALISED FOR DIAMONDS.

The only reliable evidence on this point was furnished by witnesses for De Beers Company, who are not only experts in the valuation of diamonds, but who are also in close touch with the diamond market. These witnesses estimated the price procurable for Voorspoed diamonds at from 16s. 6d. to 17s. per carat. The Board has accepted 17s. as the estimated price. Taking the above figures at 2s. 6d. for working costs, 14 carats per 100 loads as the yield, 17s per carat as the estimated price to be obtained for the diamonds, and 6,000,000 loads as the life of the mine, a working loss of £36,000 would be shown. To this would have to be added £35,000, being the amount required for new equipment of the mine, making a total loss in working of £71,000. The Board, while fully realising the impossibility of expressing in actual figures with any degree of accuracy the results to be obtained from the future working of the Voorspoed Mine, is nevertheless satisfied from the evidence submitted to it that such working would result in substantial loss. This statement does not pretend to exhaust the grounds which influenced the Board, but it is considered amply sufficient to justify the decision at which it has arrived, that, at the present time and in the present state of the diamond market, the bona fide mining and working expenses of the Voorspoed Diamond Mine cannot be met by the sale of the precious stones found therein when realised at their true and fair market value.

The above is signed by Mr. H. F. Blaine, Chairman, and Mr. P. F. Burnet-Adams, M.I.C.E., M.I.M.E., Bloemfontein, and by P. Ross Frames, Johannesburg.

ACCIDENT PREVENTION IN MINING.*

An Examination of the Causes of Mine Accidents Under Present-Day Conditions.

[By EDWARD RYAN.]

Accident prevention is a theme upon which one might dwell at great length, were he to endeavour to cover every industry; but, as my work has to do with mines and mining, it is my purpose to speak to you for a few minutes on that branch of the work, with the hope that I may be able to leave with you some thought that will aid in this great movement, and possibly will strengthen the bond between employer and employee. It is commonly supposed that by passing safety Acts and having inspectors who visit the different mines every few months, all has been done that can be done for accident prevention. This is not so. Laws are merely educational means, and the penalties provided in the Act are merely punishments for those who fail to learn their lesson. It is generally known that Nevada leads in laws looking to the prevention of accidents and the protection of those who toil underground. We have taken thirty-one of the most important points of the law, the violation of which causes most of the accidents, and, under the heading "Don't," have pointed out to the employer and employee the frequent daily crises that must be provided for. These have been printed on cloth, and are furnished all operating mines, a copy being posted at the collar of each shaft and on each working level. This keeps constantly before the miner many things that must be avoided if accidents are to be lessened. With these signs constantly before them, why do we have as many accidents as we do? There can be but one answer. The men are either incompetent, they wilfully violate the provisions looking to their safety, or they are compelled to forego the exercise of the caution pointed out by the signs, by reason of the requirements of those in authority. We all know that men constantly working in an atmosphere of danger become careless of their surroundings. They do many things they ought not to do, and daily violate State laws and company rules. The operators are often to blame for the haphazard and careless manner in which men do their work, by reason of lack of discipline. Some mine foremen—the great majority—are competent in all other lines of their work, but sadly deficient in discipline. At times they are carrying out the wishes of those higher in authority, but as a general rule I believe that the attitude of the management as regards carelessness is reflected by the men. If the superintendent is careless and indifferent, the men in turn will treat rules and regulations lightly. If, however, the superintendent shows an earnest desire to have all rules closely observed, if he makes accident prevention one of the leading features in his department, his foremen will usually reflect that attitude, and in turn will compel the men to adhere closely to all rules and regulations looking to their safety. Operators, if they wish to surround themselves with home loving law abiding honest citizens, cannot afford to neglect discipline. Slipshod methods beget carelessness and indifference, surely resulting in disagreeable conditions. Lack of proper discipline results in the gradual elimination of the better men, with its resulting increase of inefficiency and accidents. Lack of discipline is entirely too prevalent in some of the mines of our State, and the cause, "Disobedience of orders," would not be so frequently written in accident reports, were more attention paid to discipline. Let the employee know that all rules and regulations looking to his safety are to be obeyed, and if he shows a disposition not to obey, for his own sake get rid of him. Thus you will protect him from himself, and the careful employee from his careless fellow-worker. Centralise responsibility as much as possible. What is everybody's business, is nobody's business. The Nevada Consolidated Copper Company has recently inaugurated a system which I believe will go a long way toward securing the co-operation of employees in the matter of accident prevention. A monthly bulletin is issued showing the number of accidents in all departments of the work. The name of the man in direct charge is given, and the accidents on the different shifts and in each department are written directly under that of the one in direct charge. All accident reports are carefully scanned by the management and comment is made in favour of those who show a clean record as far as accident prevention goes.

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*From an address by the State Mine Inspector, delivered at the "Safety First" Conference, Reno, Nevada, January 27, 1914.

MINING MEN AND MATTERS.

Sir Lionel Phillips has left for England.

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Sir George Farrar left last week for England.

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Mr. H. C. Boyd has gone to England on a six months' trip.

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Mr. E. J. Way is the President-Elect of the S.A. Institution of Engineers.

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Among other mining men who sail this week for England are Messrs. N. J. Scholtz and W. L. White.

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It has been found possible to extend the closing day of the Mining Exhibition to Saturday, the 30th May, instead of the 29th, as originally arranged. Exhibitors will therefore have the advantage of having their exhibits shown for another day. Exhibits must be removed by midday on Tuesday, the 2nd June.

THE YEAR WITH ROBERTS VICTOR DIAMONDS.

Points from the Consulting Engineer's Report—Chairman's Review of the Position.

In his annual report, the consulting engineer of the Roberts Victor Diamonds, Ltd., writes:—The ground treated during the past year has been practically all drawn from the areas Nos. 1 and 2. A small portion of the fissure has been worked down to the 110 ft. level in the No. 1 area. Work has been greatly hampered by reason of the treacherous nature of the shale walls, which has rendered it necessary to remove an enormous quantity of reef matter. The percentage of reef to yellow ground has been nearly five to one, which results in high working costs. In the north-eastern end of the No. 1 area a considerable body of yellow ground remains to be extracted. It is estimated that this will amount to about 150,000 loads, provided the fissure maintains a width of about 60 feet and the ground can be extracted to a depth of 110 feet. No extension of the fissure to the south-west has been opened during the year, although a considerable amount of prospecting work has been done in that direction. Recent subsidences of reef on the north-eastern side of the No. 1 area have rendered the position of the boiler house somewhat precarious. Should further subsidences occur in that direction it may be necessary to remove some portion of the plant. A good deal of prospecting work has been done during the year to the north-east of the old mine; a small fissure, which was opened up in this direction, looked at one time rather promising, but later developments were disappointing. Pumping has been carried on during the year, and the water has been kept down to the 314 ft. level of the old mine; the inflow of water remains constant, viz., about 7,000 gallons per hour. The No. 1 shaft, together with the main tunnel into the mine at the 314 ft. level are in good order. The plant and machinery have been maintained in good order.

Speaking at the annual meeting of Roberts Victor Diamonds, Ltd., on April 24th. Mr. Emrys Evans said: In submitting to you the accounts for the year ended 31st December, 1913, and the report of the directors, I have pleasure in congratulating you on the successful results attending that year's operations. The profit and loss account submitted to you at this meeting shows a profit of £6,044 7s., earned as the result of the year's work. We were successful, I am glad to say, in obtaining a settlement of our claim for refund of income tax paid in previous years to the British Government, and a sum of £6,145 10s. 8d. was repaid to us. The appropriation account shows these two amounts, together with a balance to the credit of that account of £13,452 7s. 5d., making in all £25,642 5s. 1d., and, as the loans had been paid off during 1912, your board was in a position to declare the payment of dividend No. 4 at the rate of 10 per cent. in November. After deducting the amount of £15,000 involved in the payment of this dividend, and £551 9s., the amount of profits tax payable to the Government on the year's work, there remains a balance of £10,090 16s. 1d. to the credit of appropriation account at 31st December, 1913, to be carried forward.

WHY WASHING WAS NOT RESUMED.

Details of the year's work are given in the manager's and in the consulting engineer's reports which have been attached to the directors' report, and being of a full nature, there is but little for me to add. During December washing operations were suspended, to allow of all the hauling gears being employed in the removal of reef, and it was expected that by the middle of January the washing of yellow ground would have been resumed. You are aware, however, from the advices given in the Press that washing was not resumed till the beginning of March. The reason was that it was deemed advisable once washing had been stopped, to put the mine, if possible, out of danger of further subsidences of reef during the ensuing winter months, and also for the reason that heavy rains caused further subsidences of the sides. Working from the surface as we are doing, we are always liable during the summer months to interruption of work by falls of rains; but with the close of the rainy season we can look forward to a period of continuous work from April till September or October. Since washing was resumed, we have been slightly interrupted by the late rains, but I think the wisdom of dealing with the removal of reef during December, January and February, has more than been justified, for we are now assured by our manager that he can foresee several months of uninterrupted work ahead of us. The average yield of diamonds up to now has been maintained; the results for March were 18,556 loads washed for a recovery of 5,324 carats, or 28·6 carats per 100 loads, and for April to date the average yield has been per 100 loads, 25·3 carats. The latest news from the mine shows us that the portion of No. 1 area which had narrowed somewhat has now widened very considerably, and there is a large amount of good yellow ground which will very shortly be available for washing.

PROSPECTING WORK.

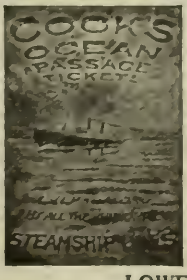
You will have seen from the report that we have obtained from the owners a prospecting contract over the remaining extent of the farm Damplaats. Prospecting work has been carried on since July on the new area, without so far any discovery of importance; but when I tell you that the new area we are prospecting covers no less than 11,238 acres you will appreciate the fact that a very considerable amount more work may have to be done before we have any good news to report. To give you an idea of the thoroughness with which the prospecting work is being carried on and the amount of work involved, I wish to mention that between July and 31st December last no less than 8,200 feet of sinking and driving were accomplished by the prospectors. It is a matter of satisfaction that, in spite of the weakness of the diamond market during the latter half of 1913, the average price realised by our products during that year was £1 1s. 2d., as against £1 1s. 3d. during the preceding year. But when one bears in mind that this price includes fine sand, and stones recovered from second sortings during 1913, the comparison is all the more satisfactory. The demand for good stones has now considerably improved, and there are indications that the price of smaller stones will also improve. I wish, in conclusion, to express on behalf of my colleagues and myself our appreciation of the service Mr. Parsley has rendered us during the past year Mr. Parsley is at present absent on four months' leave In the meantime Mr Hambrook is acting as manager.

The report and accounts were adopted.

Messrs. Emrys Evans and S. Marks were re-elected directors.

Messrs. H. J. McCrae and C. J. Watson were re-appointed auditors.

Among those present, besides Mr. Emrys Evans, were Messrs. G. Falcke, L. Sheffield, H. F. Watson, L. Marks, G. D. Massey, and M. Dold, representing 54,566 shares out of an issued capital of 150,000 shares.



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Rhodesian Section.

LATEST MINING NEWS.

A Record Gold Output—Asbestos and Chrome Iron Discoveries—Position at the Golden Kopje—Falcon Mines—The R.N.L.B.—The Antelope—Eldorado Banket.

The gold output of Southern Rhodesia for March easily beat all previous records, being 64,894 ounces, of the value of £273,237, an increase of 3,145 ounces, of the value of £13,319, on the preceding month. Other minerals: Silver, 11,363 ounces; coal (raised), 26,389 tons, (sold) 20,961 tons; lead, 16½ tons; chrome ore, 3,098 tons; diamonds, 90¼ carats.

* * * *

The *Rhodesia Herald* reports the discovery of a large and tremendously rich field of asbestos and chrome ore near Victoria Township. A company with a capital of £125,000 is being floated in London.

* * * *

From the report for the December quarter:—Golden Kopje Mine: Ore reserves—probable, 210,204 tons; average value, 6·06 dwts.; possible, 14,000 tons; average value, 6·58 dwts.; expenditure, £11,265. Union Jack Mine: Ore reserves—probable, 41,508 tons; average value, 13·61 dwts.; ore in sight end previous quarter, 45,034 tons; average value, 13·13 dwts.; expenditure during the quarter, £259. No underground work has been done, with the exception of minor shaft repairs and re-timbering No. 3 level station in the old main shaft and a little lagging in the main shaft. With the exception of the generator engine all machinery and plant is at hand, and good progress has been made with construction work." A year ago the shares commanded a moderate premium, but both securities now stand at a considerable discount. According to the statements made at the annual meeting, held in November last, production was expected to begin in June, but obviously the modifications to the plant will delay this event for at any rate several months. Those interested must derive what consolation they can from the fact that the additional funds needed have been arranged. The extra outlay will, however, necessarily postpone the participation of the shareholders in any profits that may be made.

* * * *

The quarterly report to December 31 last of the Falcon Mines states that the engineers have found it necessary to make various additions to the plant, which, added to the general rise in the cost of mining material, will cause their original estimates to be considerably exceeded and necessitate the provision of additional funds to bring the mine to the crushing stage. The directors have been able to make arrangements to finance the additional requirements. The report shows that the total ore reserves amount to 817,011 tons, made up as follows:—Oxidised ore, 178,622 tons, 6·4 dwts., 0·71 per cent. cu.; value 32·7s. Sulphide ore, 638,389 tons, 5·57 dwts., 3·15 per cent. cu.; value 53·9s.; and the capital expenditure for the quarter was £46,670.

* * * *

In the course of the Budget statement in the Legislative Council last week, the Treasurer referred to the R.N.L.B. in the following terms:—"Another item of importance is under the heading of 'Miscellaneous.' It is £12,000, the subsidy to the Native Labour Bureau. I might mention it because it is a large figure and must necessarily call for remark. I regard it practically as a liability. I do not wish to let the occasion pass without once more expressing my conviction that the country and the community are under a deep obligation to the Labour Bureau for the valuable services which it has rendered in assuring us of a supply of labour. I believe that the people who decline to get labour from the Bureau and say that they can get labour themselves are people who would not be able to get labour if there was no such Bureau. I think the action of the Bureau has opened the way for labourers from the North, and has engendered confidence between the labourers in the North and the employers in the South, and many labourers would not have come down had it not been for the exertions of the Bureau."

* * * *

The secretary (the Gold Fields Rhodesian Development Co., Ltd.) of the Antelope Gold Mine (Rhodesia), Ltd., have issued a report on operations at the Antelope Mine for the quarter ended the 31st December last, in the course of which it is stated:—

Ore Reserves.—Total tonnage previously developed, 157,923 tons, value 10·18 dwts.; less milled during quarter, 2,691 tons, value 11·50 dwts.; total ore reserves on hand to date, 155,232 tons, value 10·15 dwts. The following are the results obtained from milling and cyaniding during the period ended 31st December, 1913: November and December, tons crushed, 2,691; tons treated by cyanide, sands and slimes, 2,346; fine gold, total yield, 1,098·18 ozs.; value, £4,627. Capital Expenditure.—Main shaft, etc., £864 0s. 11d.; machinery, plant, etc., £10,924 10s. 5d.; total, £11,788 11s. 4d. Practically all development has been suspended during the period under review. Labour has chiefly been concentrated on completing the stope drives and generally preparing the mine for milling. The main shaft has been sunk to 1,344 feet, being 10 feet below the 12th level.

* * * *

The managers of the Eldorado Banket Gold Mining Company (The Gold Fields Rhodesian Development Company, Ltd.) have issued the following report on operations at the Eldorado Mines for the quarter ended 31st December last:—Ore Reserves.—Total tonnage previously developed, 46,457 tons, value 14·1 dwts.; added during quarter—not previously included in ore reserves, 13,136 tons; total, 59,593 tons; less milled during quarter, 22,961 tons; total ore reserves on hand to date, 36,632 tons, value 15·3 dwts. The following are the results obtained from milling and cyaniding during the three months ended 31st December, 1913:—October, November and December, totals, 22,961 tons crushed; treated by cyanide, sands and slimes, 22,145 tons; total yield, 8,798·27 fine ozs.; value, £37,422 18s. 5d.; profit, estimated, £13,236 1s. 2d. In November, 300 ozs. gold were withdrawn from reserve, while in December 300 ozs. were added, leaving reserve at 2,450 ozs., the same as at the end of the previous quarter. November cyanide gold includes 77·33 ozs. from slags, etc. Expenditure, total, £24,186 17s. 3d., equal to £1 1s. 0·812d. per ton crushed. Profit brought down, £13,326 1s. 2d.; add sundry revenue, £178 12s.; total, £13,414 13s. 2d. Capital Expenditure.—Vertical shaft, etc., £5,784 4s. 4d.; railway siding. prospecting, etc., £406 1s. 3d.; total, £6,190 5s. 7d. On the advice of the company's engineers, the board resolved to reduce the tonnage crushed to 4,500 tons a month, crushing with 15 stamps and one Chilian mill, which, it was estimated, would give a profit of about £4,000 a month. Milling on the reduced scale will be continued for a period of six months from 1st January, 1914, at the expiration of which the policy will be reconsidered. Since the date of this report the main reef has been encountered at the 12th level, and from the latest advices received has been exposed for a distance of 85 feet, giving an average assay value of 25·3 dwts. over 75 inches.

Rhodesia G.M. and Investment Co.

Last year the Rhodesia Gold Mining and Investment Company succeeded in making a profit of £7.000, as compared with £4.200 in 1912, raising the profit and loss credit to £32.100. The cash position does not permit of any distribution. Cash and loans total £9.800. debtors, etc., figure at £4,000. and advances to the Sabi Gold Mining Company at £27,400. Investments stand at £234,000; a note states that the quoted shares, costing £99.200. have a market value of £125,200. The schedule shows no change. No further development work has been done on the Sabi or the Felixburg claims. but the ore reserves in the Bernheim mines have been increased 12.000 tons to 24,900 tons, value 8.76 dwts. At the Pretty Polly mine. in which the Company holds a half interest, 1,300 tons were milled for a yield of 34.8s., irrespective of slimes.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Prospector's Shortcomings.

To the Editor, *South African Mining Journal.*

Sir,—Permit me a few lines to reply to Mr. Hodge. I am not a syndicate promoter, only a private investor, who has paid for and profited by experience. Mr. Hodge says he has studied mineralogy, and quotes a lot of mineralogical terms from a recently published work, and concludes with the remark: "I know it is right, but I do not understand it." It is just this lack of understanding we complain of; a man who tries to read a specialised technical treatise without the necessary training cannot lay claim to a very high order of intelligence. I thank Mr. Hodge for his confession of want of understanding, which proves my case and suitably closes my share of the correspondence. I commend Mr. Hodge to the old proverb, "A little knowledge is a dangerous thing," and once again sign myself,

A ONE-TIME MUG.

Johannesburg,
28th April, 1914.

What Rand Mining Owes to Geology.

To the Editor, *South African Mining Journal.*

Sir,—In that portion of Dr. Hatch's presidential address to the Institute of Mining and Metallurgy of London, published in your last issue, I see he credits himself with having "added to the Witwatersrand gold field an enormous area of mining ground" by linking up by boreholes in covered country the Van Ryn and Nigel—both of which he states are Main Reef series. I followed the readings of his boreholes at the time of drilling, and on page 140 of the "Geology of South Africa, by Hatch and Corstorphine," he gives the section of the country drilled through down to the Van Ryn, or *his* Main Reef, lying on slate. Allow me to state, Sir, that neither the Van Ryn nor Nigel have anything whatever to do with Main Reef series, and are as unlike in all details as chalk and cheese. Main Reef of *our* Main Reef series, from the Saxon on the one side to the Driefontein on the other, does not lie on slate as does the Van Ryn and Nigel, nor is its South Reef 400 to 1,000 feet away from it, as certain experts stated in evidence before a Judge, when alluding to the Chimes Reef, of course, which is a horse of another colour. The section he gives on page 140, as above, is a perfect section of Black Reef series (note the series!) of our Black Reef age, which covers 30,000 square miles of this country, to my knowledge, and possibly a great deal more. The Doctor has mistaken its lower portion for Main Reef, etc., of our Witwatersrand age, and makes a mermaid of it. Its dolomites—as there depicted—are its infallible pointer. Scratch out Black Reef, as he has it, and put it down below in place of the Van Ryn. For "Kimberley series" read Battery Reefs. And for "quartzites with Bird and Modder series," read Monarch and Kelly Reefs—then you have the sequence pure and simple! What he describes as "foot wall slates," in the same section, I know to be some 200 feet of fairly ferruginous shales—another pointer! That the Van Ryn has a slate foot—Yes! But it is only a few feet thick, and then come certain unmistakable sandstones, which are unique, and before to-day have caused much discussion. From the Benoni G.M. Co. westwards, and from Old Modderfontein eastwards, or S.E., the Van Ryn has yet to be located, together with Main Reef series, which overlies it by some 1,000 yards—about. That every decent reef struck out that way should be dubbed "Main Reef" is too silly for words, for, when we come down to facts, it is a fact that Main Reef on its lonely is just payable—in certain companies only. In my opinion, "What the Rand owes to Geology" it can put in its eye, as Home geologists have persistently belittled it by squeezing five payable series into one, and its reefs ditto.—I am, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg,
April 28th, 1914.

Accident Prevention and the Mining Exhibition.

For the year ending 31st March, according to the Mines Department statistics, there were 3,129 accidents on the mines, works and diggings in the Union. The result of these accidents was that 87 white and 801 coloured people were killed, 345 white and 2,398 coloured people were injured, the total casualty roll being 3,631 killed and injured. With a view to lessening this frightful loss of life and alleviating pain to the injured, the Rand Mutual Assurance Co., and the South African Red Cross Society are offering prizes and medals to those who are successful in exhibiting the best "Safety First" devices, or methods, enclosed lamps, stretchers and other ambulance appliances, and first aid boxes at the Third Mining Exhibition, to be held between the 19th and 30th May. No entrance fee is being charged to exhibitors, nor will there be any charge for the space occupied by the exhibits. Entrance to the Exhibition will also be free, so that every man, woman and child interested in this good work may visit and inspect the numerous devices which will be on show. The entries will close on the 9th May. Apart from this section of the Exhibition, space is also being allotted free of charge to those on the mines and elsewhere who can exhibit models, drawings, etc., of chemical, metallurgical, and mining apparatus, which may tend to lessen the bugbear of working costs in any way, or to improve methods of working. Commercial firms who have apparatus and appliances which may appeal to mining men, can also obtain space for their exhibits at a reasonable charge, and entries for this section close on May 1st. The Exhibition, which promises to be the most successful yet held, will be located at the Volunteer Drill Hall by kind permission of the Defence Force authorities, and the Secretary, Mr. Fred Rowland, P.O. Box 1183. 'Phone 1401, whose office is in the School of Mines Building, Eloff Street, will be pleased to furnish full particulars and entry forms on application.

A meeting of creditors of the Doornhoek Tin Mines, Ltd., now in voluntary liquidation, of which the liquidators are Messrs. Goldsbury and Dickson, will be held next Monday.

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POSITION AND PROSPECTS OF CROWN DIAMONDS.

Outlook for the Mine—Effect of Diamond Market Conditions—Mine's Extended Equipment and Capacity.

The fourth annual meeting of the Crown Diamond Mining and Exploration Co., Ltd., was held this week in Lewis and Marks' Buildings. Mr. Emrys Evans presided, and other present were Messrs. H. J. Dowdall, G. Falcke, S. Marcus, A. E. Murch, A. R. Gloag and Wm. Ross and R. W. Townsend (representing the Secretaries), representing 63,561 out of 100,000 shares.

The Chairman said: In presenting to you the report of the directors and accounts for the period of eighteen months ending December 31, 1913, I have to explain to you that the reason for our departing from the custom of making our accounts up to June 30, and instead, embodying a period of eighteen months, is that to-day I am in a better position to speak as to the prospects of the mine, in view of the practical completion of the plant, and to advise, than I should have been had the accounts been closed at June 30 last and the meeting held two or three months subsequently. The brief report of the Manager, which is issued with the reports and accounts, has given you an account of what has been done at the mine since January, 1913, when the dewatering was commenced. The machinery and plant has been largely remodelled and an aerial gear installed for the haulage of blue ground from the mine. In August the equipment was so far completed that haulage and washing of blue ground from the mine was commenced, after a month's preliminary run on old tailings. The results attending the washing operations up to December 31 last are given in the Manager's report. In November last the advisability of increasing the haulage plant was brought before the Board by the Manager, and authority was given for the purchase and installation of a second aerial gear. This gear has been completed and is now at work supplementing the first gear and enabling a larger quantity of blue ground to be hauled, and the mine kept free of stone and waste matter. It is too soon yet for me to be able to give you any accurate forecast of what results will attend the mine now that the second gear is working. Simultaneously with the putting into action of the second gear came the necessary lowering of the first gear to attack a new face at a lower level opened up in the mine, and then followed a period of very heavy rains, which have interfered with work, but there is little doubt that this increase of your hauling capacity will prove advantageous. I hope from now on the Manager will be able to keep his gears running uninterruptedly, and that we shall be able to report monthly a considerable increase in the number of loads washed and in diamonds recovered. One feature which is of very hopeful augury, and which I must not omit to remark upon, is the improvement in the appearance of the mine blue ground. Simultaneously with the erection of the gear, Mr. Dilks commenced opening up the other and deeper levels or faces below those left when work was suspended some years ago, and it has been found that there is a marked improvement in blue ground opened up in these faces. The west end, which was previously regarded as the poor section of the mine, is now supplying good blue, and it is found to be dipping at an angle of 45 degrees under the overlying bar of hardibank which, as stated in the Manager's report, will be cut out and thereby the blue contents of the mine will be added to. It is from this section that the largest and finest stones were recovered in picking. We are only now beginning to appreciate the better quality of the blue ground to which I refer, for since the first aerial gear has been lowered to the new lower level, we are for the first time drawing on and washing this better class blue. The result has been an increase in the yield by at least one carat per 100 loads during the last four weeks. Your Manager is now also drawing on and washing some of the blue ground from the floors, and we have in this floored ground an asset of some importance to supplement the mine ground. It is thoroughly pulverised by its exposure to the air, and should for that reason yield a higher average than ground treated direct—and it is cheaply washed. I may add that I have before me a short report from your manager written a few days ago, giving the latest views, and from this report I quote you the following paragraph: "To-day the mine's position is much better than at any previous period in so far as it concerns its capacity to produce diamonds, and the only obstacle to a bigger output at the present time is the prevailing wet weather. Given dry weather an increased return is assured." During the period under review the prices realised for diamonds have suffered considerable diminution, but there are indications in the reports of some of the largest producers that a working arrangement is in contemplation, having for its object the raising and stabilising of values. The importance that is attached to the maintenance of the prices of diamonds in high circles is borne out by the reference to it in the budget speech delivered last week by the Minister of Finance of the Union, who, speaking of the revenue derived from the diamond mining industry, is reported to have stated that towards the end of 1913 there had been a very serious fall in the value of diamonds of certain classes; so serious, in fact, that it might affect the revenue next year. The Government had been in consultation with some of the larger diamond producers in the country, and a decision had been come to that the time had arrived for the various producers to come to a conference to see whether some means could be devised by which it might be possible to produce greater stability in the diamond trade. A conference of diamond producers would be held some time next June, and the German Government would also participate, as they were largely concerned in the violent fluctuation. It is scarcely necessary to emphasise that any action taken to enhance the value of diamonds will greatly benefit your company. From the accounts submitted you will see that the cost to December 31 last of the additions to and remodelling of the plant, dewatering the mine and general expenses has been £22.678 0s. 5d. Since then, further expenditure has been incurred under the same heading in completing the second aerial gear and the addition of another washing pan. The moneys for this expenditure have been advanced to your company by Messrs. Lewis and Marks, and they are continuing to finance the affairs of the company. The loans, which are only secured by a bond over the property to the extent of £40,000, amounted at the close of the year to £92,350 11s. 8d. In consideration of these advances the directors have granted that firm options over unissued shares, details of which options are given in the directors' report. At the conclusion of this meeting a special general meeting of shareholders will be held to confirm the action of the directors in borrowing the moneys and in granting the option. Shareholders should appreciate the manner in which Messrs. Lewis and Marks have come forward with the very large financial assistance which they have given, and I am sure that you will all agree with me that their faith in the ultimate success of the mine is deserving of the highest reward. Your directors wish to record their appreciation of the services rendered by the manager and staff. I now beg to move the adoption of the directors' report and audited statements of account for the eighteen months ended December 31, 1913, submitted to this meeting.—The motion was adopted.

Messrs. Isaac Lewis and W. Ross were re-elected directors, and the auditors (Messrs. Alex. Aiken and Carter) were re-appointed.

The Position of the Lonely Reef G.M. Co.

The report to December 31, 1913, shows that the new main incline shaft from the 9th level was started in June last, and at December 31 had attained a depth of 221 ft. below that level. The 8th and 9th levels have been extended and a new level (the 10th) has been driven during the year. The ore reserves are estimated at 172,557 tons of an average assay value of 17·14 dwt.; this is equivalent to 2½ years' supply for the reduction plant on a milling basis of 6,000 tons per month, which represents the present capacity of the plant. The reduction plant now consists of 20 stamps and three tube mills. 58,903 tons of ore have been crushed and treated during the year and have yielded 52,011·43 ozs. of fine gold, an average return of 17·66 dwts. per ton crushed. The total amount realised, after deduction of realisation expenses, was £218,520 8s. 6d., equivalent to £3 11s. 2d. per ton crushed. The working expenses for the period, including royalty, maintenance and administration expenses, amounted to £1 11s. 4d. per ton crushed. The profit and loss account for the year shows a realised profit of £126,392. Dividends Nos. 5, 6 and 7 (30 per cent.) absorbed £81,302, and the balance of unappropriated profits is £13,192 8s. 6d. Three dividends of 10 per cent. each, making 30 per cent. for the year, have been declared and paid (free of British income tax) out of the profits earned during the year.

The following is the result of operations at the McCreedy Tin Mine for the quarter ended the 31st of March:—Concentrates recovered, 14·60 long tons; estimated net profit, £526; capital expenditure, £463.

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CONCENTRATION OF DIAMONDIFEROUS GROUND AS APPLIED AT DE BEERS.—II.

[By JAMES STEWART.]*

THE following is a continuation of our article of last week:—

About seven years ago the Collum jigs were discarded by the De Beers Company, and a new plant built, using jigs of the Hartz type, with double compartments, designed to suit our work. I have found them safer and they are doing about 50 per cent. more work than a single compartment Collum jig. The flow sheet will give a fair idea of the general arrangement of the pulsators and grease tables. There are six units under one roof, and as the diamonds from each mine have to be treated separately, each unit is concentrating the deposit from the different washing machines. The deposit is brought from the various machines to the pulsators in 16 cubic feet trucks, covered with portable lids, and securely fastened. The pulsators are centrally situated to the floors of the different mines. The trucks are tipped by means of tumblers, depositing the contents into a hopper, with a sliding door to regulate the deposit, into the boot of the elevator. The elevators are made up of 6 in. buckets spaced 2 feet apart, bolted to 7 in. 7-ply canvas belts. These belts—exclusive of water—carry up from 80 to 90 tons of gravel deposit per day of ten hours. The life of the belts is usually over twelve months. The deposit from the washing machines is elevated to an intermediate trommel 10 feet long by 3 feet in diameter, with round holes ⅜in. and ⅝in. The +⅜in.−⅝in. and +⅝in.−1¼in. go direct to the jigs. The −⅜in. product runs to a second elevator, and is elevated to trommels higher up, placed at right angles to the intermediate trommels. The first trommel is used as a wash trommel, which takes out the muddy water and slime; these go to a Caldecott cone and dewatering boxes, the slimes to tailings heap, the water being returned to the sprays of the wash trommel. The remainder passes through two long trommels covered with perforated steel with round holes of ⅛in., 3-16in. and ¼in., which make four sizes, viz., −⅛in., +⅛in.−3-16in., +3-16in.−¼in. +¼in. The three last go direct to the jigs. The −⅛in. size goes through a lower trommel covered with 1-16in. perforated copper round holes. The oversize goes direct to the jigs, the −1-16in. goes to a dewatering box, and is sent to a Richards pulsion jig, where diamonds are recovered which average about 90 to a carat. As already stated, the main jigs are of the Hartz type with double compartments. The size of the jig sieves is 3ft. 1in. × 1ft. 8in. in the clear, so that in the double sieve the total length is 6ft. 2in. × 1ft. 8in., and has a dividing plate between the two sieves. The depth of the sieves ranges from 3½in. to 5½in., according to the size of the ground they are treating. The sieves rest on brass crossbars, 2½in. × ¼in., spaced about 5in. apart, to which they are securely fastened down to prevent spring in the sieve. The more ridged the jig screen the better will the work be done. The bed will pulsate more freely and a better concentration will be obtained. To obtain close concentration in jigging diamondiferous deposits, close sizing is necessary. The closer the sizing the more perfect the concentration will be. The minerals gravitating into the hutch with the diamonds amount to 15 per cent. of the deposit received from the washing machines or ·19 per cent. of the blue washed, and have a range in specific gravity from 3·25 to 4·7, and, as the diamond is 3·53, it will readily be seen that it is impossible to throw any of these minerals over the tail of the jig without losing some of the diamonds. The tailings from the jigs are dewatered and carried away on a conveyor belt. For the safe working of the pulsators (I am now speaking of the finishing pulsators) it is necessary that there should be a regular and steady feed. The pulsation should be free and equal over the whole area of the sieve. The tendency in all plunger jigs is for the concentrates to creep forward towards the tail. To avoid this I have found it a good plan to give the sieve a slight fall to the head end. In the whole length of the double compartment jig I give the sieve a fall of ⅜in. to the head. This prevents creep and lays the concentrate equally over the bead of the jig. The depth of the plunger partition below the sieve has also an important bearing on the equal pulsation of the sieve. The depth should never be less than one-half the width of the sieve. The jig screen or sieve is a matter that should receive consideration, since a broken sieve will drop too much into the hutch and cause a loss of time in rewiring. Some years ago I substituted brass for steel mesh, and found that the life of the brass sieve was about eight times that of the steel sieve. This is on account of corrosion due to acids and salts in the blue ground. Brass sieves are used in treating sizes from −⅛in. to −⅝in. For the larger sizes steel perforated plates are used. On the coarse jigs treating mixed sizes from +⅝in. to −1¼in., ⅞in. perforated plate for jig screen is used. This jig makes its own bed. Concentrates and diamonds of a size that will pass through the ⅞in. perforated jig screen gravitate into the hutch, and drop into a watertight receptacle fixed to the bottom of the machine. When it is desired to empty the receptacle a plug is dropped into the discharge hole of the hutch; thus the concentrates can be drawn off without interfering with the work of the machine. These concentrates are sorted by hand, but provision is being made to put this size also over a grease table. Diamonds larger than ⅞in. are retained on the bed of the sieve, which is sorted for diamonds at the end of the day's run. The concentrates from all jigs up to −⅝in. are discharged automatically through pipes fixed to the bottom of the machines and small elevators. The elevators are closed in and are full of water up to the working level of the sieves. Perforated brass buckets are used which dewater the concentrates as they rise above the water, and discharge them into the feed hoppers of the grease tables. The rate of pulsation for the smaller sizes is 180 and for the coarse size 172 per minute. Previous to the discovery of the affinity of grease to the diamond, made by Mr. Fred Kirsten, all concentrates from the pulsators were sorted by hand, and were usually sorted over three times before being discarded. The grease tables have simplified the extraction of the diamond from the concentrates to a very great extent, and many more small diamonds are recovered than were formerly by hand sorting. The tables are conveniently arranged in a row on one side of the pulsator machines. Each table is built in two halves with driving shaft in centre. The tables are hung from brackets by steel blades, and are shaken by four eccentrics, two for each half of the table, the throw being set opposite each other in order to balance the motion of the table. The length of each half-table is 7ft. by 2ft. 4in. wide. They are driven at 250 revolutions per minute, and have a slope varying from 6½° to 10½°. The surface of the tables is covered with a thin coating of fairly stiff grade of petroleum jelly, crude vaseline, which can be used several times. On the first 2 feet at head end of table fresh grease is always used; old grease is used on the remainder. The diamonds, together with a small percentage of the concentrates, adhere to the grease, while the remainder is washed off the table by a thin flow of water. Over 99½ per cent. of the diamonds are recovered within 12 inches of where they are delivered on to the tables. In removing the diamonds from the tables it is only necessary to take off a small portion of the grease from the head end of the table and renew it. This is done two or three times in the course of the day's run. The remaining length of the table is simply dressed down to take any grit or stray diamonds off the surface of the grease. The whole surface of the tables is cleaned and regreased every second or third day. The grease is separated from the diamonds by putting the diamonds into a pot or cage, made of fine perforated plate; it is then revolved in boiling water, the grease melts and floats on the surface of the water, and is then skimmed off mechanically, clarified and used again. As I have already shown that over 99½ per cent. of the diamonds can be recovered within a short distance of where the concentrates are delivered to the tables, and that it is not necessary to remove the whole of the grease, a device is being adapted to the present tables. It consists of an endless belt, 17in. wide, which will travel, when required to take off the diamonds, across the head end of the table, the diamonds being scraped off automatically and the belt regreased by passing under a box with an open bottom containing grease resting on the belt. As the belt passes under the box the grease is pressed on to it, and the desired thickness of the grease is regulated by having a space of 1-16in. between the belt and the edge of the box. By regulating the space any desired thickness of coating may be obtained. There are four full tables in row for each unit of the pulsators. The concentrates from tables treating −1-16in. to −¼in. flow over a safety table immediately following the first table. The concentrates from tables treating from +¼in. to −⅝in. flow into a small safety jig, where they are concentrated to the smallest possible quantity and sorted by hand for any diamonds that may slip over the tables. The tailings from the tables are dewatered and carried away on a conveyor belt. Careful records of the diamonds recovered on the second tables and small safety jigs at end of tables treating +¼in. to −⅝in. are kept, which show a recovery of 0·001 of the whole. To obtain good work on the grease tables it is absolutely necessary that the concentrate from the jigs should be clean and free from silt as far as possible, because the silt, or fine grit, will crust the surface of the grease and prevent a good recovery. The quality of the water has also an important bearing on the efficiency of the work. Hard water, or water containing lime or salts, will affect the recovery, due, I think, although it is difficult to prove, to the deposition of lime on the surface of the diamond, although not perceptible to the naked eye, probably causing the surface of the diamond to be wetted and thereby preventing adhesion. A very good example of this may be given. Put a wet pebble on a piece of grease and turn it over, when the pebble will fall off, but if dry it will adhere. Some years ago I had occasion to treat some yellow ground from the Wesselton Mine, and although we had been recovering the diamonds from the blue successfully, the greatest difficulty was experienced in recovering the diamonds from the yellow ground. As much as 37 per cent. of the diamonds was lost off the tables. This, no doubt, is due to a solution of lime in the yellow ground, acquired from the country limestone, which affects the diamond in the same way as hard water. A similar experience occurred when some concentrate and diamonds from the German South West African fields were brought to Kimberley for the purpose of being tried over our grease tables. At first the result was very disappointing; most of the diamonds rolled off the table. We then discovered that the diamonds were salt to the taste, due to a solution of salt on the surface of the diamond from the sea water. The diamonds were then washed in soft water, when they adhered readily. During the winter months the cold water forms a slightly hard film on the surface of the grease, and for good work I find it necessary to warm the water for the grease tables by putting it through heaters, keeping the temperature up to 62°. The water from the whole plant flows over six large settling dams and is returned to the pumps. The quantity of water used on the jigs and trommel sprays amounts to 2,280 gallons per load of deposit washed. The grease tables use about 2,130 gallons per load of concentrate passed over the tables. The following is a note of a series of tests made at the pulsator with a view to determine the amount of concentration in the washing of the blue through the various stages, i.e., from the washing machine to the sorting tables. Based on one week's working.

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*Paper read before the Kimberley Branch of the S.A.I. of E.

Number of loads washed by the rotary machines, 172,136, equal to 2,754,176 cubic feet. This was reduced by the rotary machines to 35,804 cubic feet, a reduction of 76·9 cubic feet to one cubic foot which was received at the pulsator. At the pulsator the jigs further reduced the 35,804 cubic feet to 5,370 cubic feet, a reduction of 6·66 cubic feet to one cubic foot. After passing the 5,370 cubic feet over the grease tables and the magnetic machine it was further reduced to 1,440 cubic inches, or ·833 of a cubic foot, equal to ·00003 per cent. of the blue ground treated, a reduction on the grease tables of 6,447 to 1 which is received on the sorting tables. The small concentrates from the tables, which is largely composed of ilmenite and pyrites, are passed over a Weatherill magnetic separator, which extracts the ilmenite and other magnetic minerals. Test made to determine the percentage of diamonds recovered on the first 14 inches of the grease tables: Diamonds recovered on first 14 inches, 4,964 carats; diamonds recovered on remainder of table, 9 carats; percentage of diamonds recovered on first 14 inches was 99·82 per cent. of the whole. Tests of second tables, six months' returns: From 1,211,552 carats the second tables recovered 1,249 carats, equal to ·001 of the whole. The natural pulverisation of the ground by weathering versus direct treatment is a subject beyond the scope of this paper, but is one that might be taken up as a subject having an important bearing in the extraction of the diamond from the matrix. Where it is possible to pulverise ground by exposure there can be no doubt that the yield will be very much greater; besides, by direct treatment there is the risk of breaking some of the diamonds and thereby reducing their value. Some years ago the Kamfersdam Mine, which at that time was treating their ground direct, as an experiment floored a few thousand loads, exposing them for about two months. The yield obtained from the natural pulverised ground, I have been told, amounted to 50 per cent. more than by direct treatment. I know this subject opens up a large field for discussion, and I hope I may be pardoned for introducing it in this paper.

THE WEEK IN THE SHAREMARKET.

Improvement Follows Better News from America and Ulster—Dividend Payers Appreciate—Diamonds and Tins Improve.

THE clearing of the air with regard to Ulster and the more favourable news from America had an instant effect on markets. All the leading Rand stocks responded to the better tone, and dividend payers in particular were in demand. There can be no doubt that, given a respite from complications in Home and American politics, the South African market is bound to enjoy a period of increased activity. Tins were also better on good news from Zaaiplaats, and diamonds improved with the general market and the announcement of a conference of producers to regulate the market. At the moment of writing the general prospects seem brighter than they have for a long time and it is to be hoped that the long overdue revival is at hand.

* * * *

	Fri. 24th.	Sat. 25th.	Mon. 27th.	Tues. 28th.	Wed. 29th.	Thur. 30th.
Adair-Usher	—	0 5*	0 5*	0 5*	—	0 5*
African Farms	12 6*	12 6*	12 7	12 10*	13 0	13 6
Apex Mines	18 0*	18 0*	18 0*	18 0*	18 0*	18 6*
Bantjes Cons.	13 9*	—	13 6*	—	13 6*	—
Benoni Cons.	1 9*	1 9	1 9*	1 9*	1 9*	1 9*
Blaauwbosch Dias.	—	—	—	77 6*	—	—
Brakpan Mines	—	—	40 0*	41 3*	42 6†	—
Breyten Collieries	27 0*	27 6*	27 6*	27 6*	27 0*	—
British South Africa	—	—	—	16 9*	16 9*	—
Bushveld Tins	0 6*	0 8*	0 7*	—	0 7*	0 8*
Cassel Coals	—	15 0*	15 0*	15 0*	15 0*	15 0*
City and Subs.	47 3*	47 3*	47 0*	47 6*	47 6*	47 6*
City Deeps	63 9*	63 0*	62 6*	62 6*	63 0*	64 6*
Cloverfield Mines	—	4 4	4 3*	4 3*	4 4*	4 6*
Clydesdale Collieries	9 0*	9 6*	9 6*	—	—	—
Con. Langlaagtes	31 9*	31 9*	—	31 9*	31 9	32 3
Coronation Colls.	—	—	—	—	22 6†	—
Con. Main Reefs	17 6*	17 6	17 3*	17 3*	17 3*	17 6*
Con. Mines Selection	7 9*	7 6*	7 6	—	7 6*	7 6*
Coronation Freeholds.	0 4½*	0 4*	—	0 4*	0 4*	0 4*
Coronation Synd.	—	—	—	—	—	3 0*
Crown Diamonds	7 0†	—	5 9	5 9*	6 0*	6 6*
Crown Mines Deb.	£98*	—	—	£98*		£98*
Durban Roodepoort	—	—	16 6*	—	—	—
East Rand Centrals	—	2 3†	—	—	—	—
East Rand Coals	1 7*	1 8*	—	—	1 6*	1 6*
East Rand Deeps	1 6*	1 5*	1 4*	1 4*	1 4*	—
East Rand Props.	35 0*	—	35 0*	35 6*	36 0	35 9*
East Rand Debs.	£83*	£83*	£84*	£83*	—	—
Eastern Golds	1 0*	1 0*	1 3†	1 0*	1 0*	1 0*
Frank Smiths	4 7	4 6*	4 6*	4 6*	4 5*	4 6*
Geduld Props.	23 0*	22 6*	—	22 0*	22 0*	23 0*
Glencoe Collieries	—	6 6*	6 9*	—	6 6*	—
Glynn's Lydenburgs	10 0*	—	—	—	—	—
Govt. Areas	19 9*	20 0	19 9	20 0	20 0	20 3*
Joh. Bd. of Ex.	25 0†	—	25 0†	—	—	—
Kaalfontein Dias.	—	—	—	0 3	0 5	0 6*
Klerksdorp Props.	2 4*	2 4*	2 4*	2 4*	2 4*	2 5
Knights Centrals	8 9*	8 11	8 10*	8 10*	8 9*	9 2*
Knights Deeps	—	—	—	—	34 0*	34 0*
Lace Props.	3 0*	3 0*	3 1*	3 1*	3 1*	3 3*
Langlaagte Estates,	—	—	—	16 3*	—	—
Luipaardsvlei Estate	9 6	10 0†	9 6*	9 6*	9 6*	10 0†
Lydenburg Farms	2 8*	2 8*	2 8*	2 8*	2 8*	—
Main Reef Wests	6 0*	6 6*	6 6*	6 6*	6 3*	6 3*

*Buyers. †Sellers.

	Fri. 24th.	Sat. 25th.	Mon. 27th.	Tues. 28th.	Wed. 29th.	Thur. 30th.
M.R. West Debs..	—	—	£70*	—	—	—
Meyer & Charltons	—	—	—	105 0*	—	—
Middelvlei Estates	1 0*	1 0*	—	—	1 0*	1 0*
Modder B.'s.	—	80 0*	81 0*	80 0*	81 0*	82 6
Modder Deeps	45 9	46 0*	45 9*	45 0*	45 9	47 0
New Boksurgs	0 9*	0 9*	—	0 9*	0 9*	—
New Eland Diamonds	28 0†	—	—	—	—	25 0
New Era Cons.	5 6*	—	5 6	5 6*	5 6*	5 8*
New Geduld Deeps	1 8*	—	1 9*	—	—	1 9*
New Gochs			12 6*	—	12 6*	12 6*
New Heriots	62 6†		—	62 0†	61 6†	—
New Modderfontein	250 0	247 6*	240 0*	—	245 0*	250 0*
New Unifieds	16 0*	—	—	—	15 6*	15 6*
New Kleinfonteins	22 6	22 6*	22 6*	22 3*	22 6*	23 6
Orange Diamonds	0 9*	0 11*	1 0	1 0*	1 2*	1 3*
Pigg's Peak	9 9*	—	9 9*	9 9*	9 9*	—
Pretoria Cements	45 6	45 0*	45 6	44 0*	44 6*	44 6*
Princess Estates	—	4 9*	—	4 6*	—	4 6*
Rand Klips	2 3*	2 2*	2 3	2 2	2 3*	2 3*
Rand Nucleus	1 6*	1 7*	1 7*	1 7*	1 7*	1 8*
Randfontein Deeps	3 5*	3 4*	3 4*	3 3*	3 4*	2 3*
Randfontein Estates	22 0*	21 9*	21 9*	21 6*	21 9*	22 0*
Roberts Victors	—	—	20 0*	—	—	20 0*
Robinson Deeps	—	—	—	—	—	30 0†
Rooibergs	21 6*	22 6*	23 0*	23 3*	23 3*	24 0*
Ryan Nigels	—	—	3 0†	—	—	3 0†
Shebas	4 6*	4 3*	4 3*	4 3*	4 3*	4 3*
Simmer Deeps	2 0*	2 3	—	—	2 3	—
S.A. Breweries	—	—	—	—	39 6*	—
S.A. Lands	—	2 9	2 8*	2 8*	2 9	—
Springs Mines	—	—	12 3*	12 0*	—	12 6
Sub-Nigels	10 9*	11 0*	10 6*	10 9*	10 9*	11 3*
Swaziland Tins	—	—	30 0*	36 3†	—	37 6†
Trans. Coal Trusts	27 3*	27 6*	29 0†	28 6†	28 6†	29 6†
Trans. G.M. Estates	35 0*	36 0*	35 6*	—	—	—
Tudors	1 0*	—	—	—	1 0*	—
Van Ryn Deeps	44 6	44 6*	44 6	44 3*	44 6	45 6*
Village Deeps	35 0*	35 0*	36 3*	36 9	37 0	37 6*
Vogel Con. Deeps	0 9*	—	0 9*	—	—	—
West Rand Cons.	—	—	8 0*	8 0*	8 3*	8 3*
Western Rand Estates	2 0*	—	2 0*	2 0*	2 0*	2 0*
Witbank Collieries	—	44 0*	43 6*	—	—	—
Witwatersrands	—	68 0*	67 6*	67 6*	67 6*	68 6*
Wit. Deeps	52 0*	52 0*	51 0*	51 0*	52 6	53 9*
Wolhuters	15 0*	15 3*	15 3*	15 6*	15 6*	15 6*
Zaaiplaats Tins	22 6	25 3	24 3	25 0	24 6*	26 3*

*Buyers. †Sellers.

In the House of Assembly, on May 15, Mr. Merriman is to bring up his petition for the removal of the colour bar.

PROSPECTOR wants financial backing for promising deep lead (diamonds) formation under Karoo sandstone; also reef proposition in same district. Diamonds found. Reef going from 4 dwts. to 6 ozs. £200 required.—Apply "H.H.," c/o S. A. *Mining Journal*, Box 963, Johannesburg.

The Third Annual MINING EXHIBITION

(Under the auspices of the Chemical, Metallurgical and Mining Society of S.A.)

To be held in the

Volunteer Drill Hall, Twist St., Johannesburg,

May 19th to 29th, 1914.

"S.A. MINING JOURNAL"

Special Mining Exhibition and "Safety First" Supplement,

TO BE ISSUED MAY 23rd, 1914.

A Special Illustrated Supplement will be included in the "S.A. Mining Journal" of May 23rd, dealing with the Third Annual Mining Exhibition. Among the chief contents will be the following:—

LEADING FEATURES.

- **The Use and Function of Mining Exhibitions.**
- **Chemical and Metallurgical Apparatus at the Exhibition.**
- **Mining Machinery and Models on View.**
- **Some Natural Products of S.A. and their Industrial Possibilities.**
- **The Promoters and Organizers of the Exhibition** (illustrated).
- **New Devices and Labour-saving Inventions** (illustrated).
- **Some Rock Drill Exhibits.**
- **The New Hammer Drills and their Significance.**
- **Some Stamp Battery Improvements.**
- **The Progress of Modern Wire Rope Manufacture** (illustrated).
- **Important Metallurgical Specialities.**
- **Mine Rescue Apparatus and "First Aid" Appliances.**
- **Results of S.A. Red Cross Society Competitions.**

SPECIAL "SAFETY FIRST" SECTION.

- **The "Safety First" Committee Competition.**
- **Winning Ideas and Devices** (described and illustrated).
- **Progress of the "Safety First" Movement on the Rand.**
- **A Review of Work Done by the "Safety First" Committee of the Rand Mutual Assurance Company.**
- **Results of the Movement Elsewhere.**
- **"Safety First" Devices** (illustrated).
- **The Mines Department and the Movement.**
- **The Mines Department Accident Museum** (illustrated).

THE SOUTH AFRICAN MINING JOURNAL

P.O. Box 963. *Advertising Department,* P.O. Box 963.

176-180, Stock Exchange, JOHANNESBURG.

Engineering Notes and News.

THE QUESTION OF CAST IRON v. STEEL PIPES.

Emphatic Testimony by the English Local Government Board—Reply to Recent Articles in the "S.A. Mining Journal."

[BY A SPECIAL CORRESPONDENT.]

" ONE tale is good until another is told." I think of this English maxim as I read a striking statement concerning water and gas mains just published under authoritative circumstances. For there were printed in issues of " The South African Mining Journal " in September articles which told a tale entirely contrary in spirit and fact to the language of the notable declaration now arresting the attention of engineers and surveyors and municipal administrators everywhere. The articles mentioned were calculated to cause the uninitiated to carry away the impression that steel pipes are incontestably superior to cast iron mains for all municipal purposes; cast iron pipes, the reader would conceive, would speedily be met with only in museums. Whether artful or artless, a suggestion less well-founded was never printed. Against these two articles we would be content to place two sentences, even if they were to stand alone: " The Board, while giving thirty years for cast-iron pipes, give only twenty years for steel tubes when not tapped, and fifteen years when tapped. This is because the Board are advised by their engineering experts that steel tubes have a shorter life." " Why? " you ask. The articles printed in September were obviously founded upon assertions made in a pamphlet circulated by a steel-pipe manufactory company, which has its headquarters in Germany; the assertions have been accepted. doubtless, in good faith, but the impressions taken from them are utterly false. The strong testimonial in support of cast iron pipes, printed above, stands upon a footing entirely different. It was made at the offices of the Local Government Board of Great Britain (the fine building at the foot of Parliament Street, fronting the Legislative Palace at St. Stephen's, the offices where lately Mr. John Burns sat in State and where Mr. Herbert Samuel now presides); and it was made to the representative of a leading local journal (" The South Wales Daily News "), who had called in consequence of conditions attached to a loan to the Tredegar Urban District Council, sanctioned by the Local Government Board. The affirmations of a German trade pamphlet must " hide their diminished head " before a statement emanating from a source so authoritative.

The champions of steel tubes in South Africa are anxious to propagate the belief that the principal enemies of water-mains are the acids and acid-salts contained in water and soil. These are important; but the most frequent and the deadliest enemy is the form of rust, to which we shall refer later. But were acids and salines the enemies most to be feared, cast iron has far less reason than steel to fear them. Two illustrations of the greater precariousness of steel in this particular can be cited from our own Union. The corrosion that rendered the steel main at Ladysmith to be abandoned within twelve years, was due to the saline moisture in the soil. The destruction of the steel piping at Port Elizabeth within seven years, despite the wrapping of the pipe in tarred hessian cloth, is attributable to the same cause. The advertisers of the virtues of steel tubes acknowledge that where dangers from acids exist, steel tubes offer no greater resistance than cast-iron pipes, but as a matter of fact, acids play comparatively a very small part in the deterioration of cast-iron pipes, for it must be remembered that the body of metal in the cast-iron article is three or four times thicker than the steel in like sizes. To cause acids to loom large in this connection is to make mountains out of mole-hills. Even if all they say upon this head, with the inferences thereupon, would bear the emphasis they use, the allegation would be a very small factor indeed.

While they were cataloguing the risks, the " tubists " might have mentioned the enemies who make war upon the interior of mains. The presence of carbonic acid or oxygen in solution in the water conveyed is full of peril for steel tubes. The most dangerous zone in a pipe is that internal range between wind and water, for perforation here may give rise to contamination of the supply, with consequent spread of devastating disease. The best water, through contact at its source with vegetable mould or humus, is apt to be impregnated with acids, while the water which comes through limestone carries carbonic acid that effects steel pipes seriously. The " tubists " make a great parade of the additional protection they provide for the exterior of their mains, but the interior, as seriously liable to decay, is necessarily left with the bituminous coating unprotected. This is not a minor point. A cast-iron main, because of its substantial thickness, is affected only slightly, if at all, by acid attack; but the steel mains are peculiarly susceptible to perforation in this way, not only because of their thinness, but because of the chemico-galvanic activity producing corrosion. which may run the walls of the pipes to the thinness of notepaper. in which state, of course. perforation may befall at any moment. A Government Engineer reports that after only four years service corrosion had so affected steel pipes " you could poke your finger through them." If you want a vivid illustration of the point here, seek the history of the steel pipe crossing the Tay Bridge, which, although originally a quarter of an inch thick, is now reported from Dundee to be perforated from the inside after a service of only twenty years.

All these considerations, however, give way, as has been already observed, before the deterioration of mains through the play of moisture upon the texture of pipes; for the damage done by acids is much less general than the damage wrought by the mere contact of oxygen and steel with moisture. If a water or gas main is seriously susceptible to corrosive destruction, it lacks the chief claim to consideration on the part of those responsible for the selection of the material. For, after all, in works of permanent utility, durability is the prime consideration.

Now, steel is upon all grounds acknowledged to be peculiarly subject to corrosion. Corrision has been known to set in, in the case of steel mains, even before they have got into service, and everybody with general knowledge admits that when corrosion has once been started in steel it cannot be controlled by scraping or coating. The service of steel mains can in no way be compared with the prolonged service given invariably by cast-iron mains.

The interesting question: Why does steel possess the weakness of rust in peculiar degree? we will not attempt to decide. It has long been known that metals, like human beings, are subject to disease, and as the discussion on these enlarge, it is rapidly being recognised over a wide area that steel (thanks, may be, to the surprising velocities and seeming vagaries of the crystal formation), is singularly liable to suffer when passing through the mill of actual life, so to write. Than " true as steel " there was never popular saying more fraudulent. It would appear that what contributes most to the mechanical strength of steel is its chief weakness from the point of view of rust. Fatigue of steel, together with the subtle forces of corrosion, it is now generally believed, has been the cause of a number of calamities, like the fall of the Tay Bridge and the Bridge at Quebec, hitherto treated as mysteries; and of late months it has been decided in authoritative quarters that electricity exercises a most disastrous influence upon steel—it is certainly known that the instability of steel is induced in a large degree by the proximity of services or workshops where electricity is the motive power. Whatever be the causes of the changeableness which marks the character or course of steel, there can be no doubt that the undeniable changefulness is the secret of the corrosion which so emphatically distinguishes it.

Truly it is tersely said that rust is the arch-enemy of steel. Anyone who has superintended the repair of ships or steel bridges will retain a graphic remembrance of the artistry of the lace-like traceries which are the effects of destructive corrosion—all that is left of the plates or webs of substantial girders! At the present moment thousands of pounds are being devoted at this early date to the renewal of the plates of the footway of the Forth Bridge.

It is not suggested that cast-iron plates do not rust, they may: but the molecules comprising this form of iron being practically inert, it rusts uniformly and vastly more slowly than do steel pipes—in fact it might almost be concluded that after undergoing attack to an insignificant degree, cast-iron pipes cease to rust after a few years. Even if this were not so, the advantage would still be decidedly on the side of cast-iron mains. It has been confidently asserted that steel corrodes three times as quickly as cast-iron, but assuming the same rate of corrosion, cast-iron, being four times as thick, will last four times as long.

A variety of reasons may be offered for according a preference to steel pipes—for instance their greatly reduced weight, with the consequent easier handling, their easier conveyance to distant or difficult regions, their cheaper freights—but all these reasons are out-weighed by their liability to rapid corrosion—particularly their liability to corrosion by oxygen in presence of moisture—a malignant trouble cannot possibly be physicked away, however skilful the physician. "It is well-known "—mark well the phrase—" that steel lends itself to corrosion very much more rapidly than cast-iron." These the reader may conceive to be the words of some advocate of cast-iron pipes; but in this he would be mistaken. They are the words of a gentleman widely known as a maker of steel pipes, a member of an eminent and familiar firm, used in a discussion at the Society of Engineers on December 13, 1913. Need more be said? When cast-iron pipes are in question, fear of destruction by perforation through the rusting of the iron is altogether a secondary consideration in the mind of an engineer.

So widely acknowledged is the hazard of vulnerability, the makers of steel pipes devote their greatest attention to the protection of the pipes, covering up the main most carefully with a heavy overcoat of tarred hessian cloth. It is not denied that cast-iron pipes are also coated, but they are coated with a simple admixture of pitch oils—a coating provided as a protection against vegetable or mineral growths in the interior of the pipes that may tend to reduce their carrying capacity as well as against rust. But as a barrier, the insidious and rapid advance of rust, the hessian coat in which the steel main is dressed can only be compared to deal plank opposed to the Rontgen rays, which penetrate the densest of substances as easily as glass. "It is a fallacy to suppose that the hessian cloth will act as an additional coating to protect the pipes: it is merely intended as a mechanical protection for the Angus-Smith solution during transit and while being handled in the trenches." This, again, is the testimony of the steel-pipe maker already alluded to. Again: need more be said? The steel pipes, their manufacturers acknowledge, are gravely liable to rust without the covering of hessian cloth: yet, according to an eminent maker, the hessian armour is no armour at all. Is it not more than probable that in the course of time the hessian cloth covering will become a trap for the gathering of the moisture which it is sought so assiduously to exclude? There are no such controversies where cast-iron pipes are in question.

But enough for this issue. Upon another occasion we may put in contrast with the short service of steel pipes, the prolonged and useful service given by cast-iron pipes—instances of 50, 80, 100 and even 250 years being quotable, while it can be shown incontestably that upon the only proper basis of cast—that is, lastingness, cast-iron pipes are at least three times cheaper than steel pipes. There can be no wonder that the Local Government Board of England has declared so powerfully its well-founded preference for cast-iron mains.

"Safety First" Lectures at Mining Exhibition.

The "Safety First" campaign against accidents on and in the mines is progressing apace. It has been arranged to hold a series of lectures on "Safety First" measures at the Volunteer Drill Hall during the period the Mining Exhibition is open. Mr. Archibold, the Deputy Inspector of Mines at Krugersdorp, will give two lectures on "Safety Measures in Mining." The Government Mining Engineer (Mr. R. N. Kotze) and Mr. H. Neuhaus (Chairman of the "Safety First" Committee), will take the chair at these two lectures. Mr. A. Richardson will preside at the lecture to be given by Mr. Chas. B. Saner (General Manager of the Luipaardsvlei Estate and G.M. Co.) on "Safety Measures in Shaft Sinking." Mr. Saner, it will be remembered, was remarkably successful in sinking the Turf Mines and South Rand shafts. Mr. Wm. Cullen will occupy the chair at a lecture to be given on "Rescue Appliances," by Dr. L. G. Irvine, the well-known author of "First Aid in Mining," published by the South African Red Cross Society. Mr. Cullen, of whose versatility too much cannot be said, will lecture on "Safety Measures in the Use of Explosives," a subject upon which there cannot be a more able exponent. Mr. F. W. Girdler Brown, the well-known General Manager of the Meyer and Charlton, will give several addresses on, and demonstrations of "Electric Blasting," as carried out so successfully on his mine. All these subjects are of vital importance to mining men, and it is hoped that they will take every advantage of the opportunities afforded to obtain first-hand knowledge, freely given by these experts. Admission both to the Exhibition and the lectures will be free, so that no one need keep away on the ground of expense.

The best "Reef Traveller" is the *South African Mining Journal*.

Mr. David Draper mentions in the *Mining and Scientific Press* that when the Rietfontein reef was being opened up, a number of nuggets of gold were taken from the mortar-box, and some were found in handling the ore. "One of these nuggets weighed over two ounces, and several were over an ounce in weight. There were about 20 in all. They were handed to me for exhibition in the Chamber of Mines' museum, of which I was curator for a number of years, but at the outbreak of the war they were returned to the late Harold Strange, managing director of the Rietfontein company, and they are now probably in the possession of his executors. They were ordinary nuggets, such as are found in alluvial gold-bearing deposits."

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Finance, Commerce, and Industries.

The Railway Budget.

Briefly put, Mr. Burton's Railway Budget is as follows:—Anticipated deficit for year 1913-14, £288,520, to be met by appropriating this amount from the Rates Equalisation Fund. For the current the estimated expenditure is:—Railways, £13,012,923; Harbours, £1,301,105; total, £14,314,000. Estimated revenue:—Railways, £13,237,000; Harbours, £1,011,000; total, £14,248,000. Estimated deficit, 1914-15, £66,000.

* * * *

A New Fertiliser.

A company with the title of "Shell Fertilisers, Ltd.," is now being formed, with headquarters at Capetown, having for its object the utilisation of enormous quantities of the offal of crayfish and other fish taken from the waters of the Peninsula. The company proposes to import and erect on a site close to Capetown a plant for the treatment of this and other fish and animal refuse, capable of turning out 15 tons per day of complete fertilisers. The company, it is claimed, has a prosperous future in store, looking to the fact that last year the Union spent on imported fertilisers more than £200,000, and that the demand for such aids to farming is expanding rapidly. The directors of the company are J. Gerber (Mosenthal & Co.), C. Heatlie, M.L.A., H. Liberman, J. W. Herbert, Chas. Friedlander and S. Rapp. We have, of course, only the opinions of the promoters to vouch for the claims made.

* * * *

Netherlands Trade with South Africa.

The sixth annual report of the Netherlands Chamber of Commerce at Johannesburg has been issued. The council are much gratified to place on record the honour conferred upon the Chamber by H.R.H. Prince Henry of the Netherlands having become a patron of the institution. At the end of the previous year the Chamber consisted of 150 members, which number has since increased by 59, making a total for the year under review of 209. The continual increase in membership, dating from the inception of the Chamber in 1907 up to now, furnished proof that its services were recognised. The expediency of the Chamber had been fully proved. The trade between the Netherlands and South Africa was flourishing. Dealing with trade between the Netherlands and South Africa, the report proceeds: "There is every indication that trade between the Netherlands and South Africa is progressing. We have been instrumental in establishing business relations between the two countries on a larger scale than hitherto. Another gratifying feature which clearly indicates a growing interest in the above mentioned trade is the increasing number of visitors to the sample rooms, which were removed to more central, commodious, and larger premises last year. Moreover, our correspondence with the Netherlands has had very satisfactory results. The official trade statistics also show an increased importation into South Africa of the products of the Netherlands. On this occasion we wish to remark that all goods from Holland which are prepared or packed in other countries, and shipped from other than Dutch ports are not compiled under the heading 'Imports from Holland,' thereby diminishing the importance of the Netherlands as an exporting country to the casual observer who has not studied the question on its real merits. Consequently the figures as issued by the Statistical Office of the Department of Customs and Excise of the Union do not fully show the progress of Holland's trade with South Africa. Taking this into consideration, the figures of the imports from the Netherlands into British South Africa for the first nine months of 1913, as compared with those for the corresponding period of 1912, and as compiled by the Statistical Office are the more satisfactory. They show a further statistical increase from 1st January, 1911, to 1st October, 1913, up to £209,446. In view of the unfavourable conditions that have prevailed this year in South Africa, viz., the drought and the industrial upheaval of July, this result must be considered gratifying." In conclusion, the report says:—"Against the fact that the local trade during 1913 has been unfavourable, we are pleased to state that the outlook for 1914 is better, as good rains fell at the end of 1913, and the after effects of the strike are easing off. Moreover, the enormous general progress of South Africa during the last four or five years is sufficient guarantee for further improvement."

* * * *

Manufacturers Life Insurance Co.

The twenty-seventh annual report of the Manufacturers Life Insurance Co. has been issued. It shows that insurances issued and paid for during the year were £2,660,364 4s. 11d., an increase over 1912 of £151,507 12s. 1d. The total insurance in force at December 31st was £16,565,730 8s. 3d. The net premium income was £615,797 0s. 9d., an increase over 1912 of £46,800 11s. 7d. The total income, £817,209 15s. 9d. exceeded the total outgo by £320,535 2s. 3d. The following figures show the substantial growth of the company during the last decade:—Insurances issued and paid for, (1903) £1,386,532 12s. 1d., (1913) £2,660,364 4s. 11d.; insurance in force, December 31st, (1903) £6,994,666 0s. 7d., (1913) £16,565,730 8s. 3d.; income, (1903) £294,922 6s. 3d., (1913) £817,209 15s. 9d.; payments to beneficiaries and policyholders, (1903) £75,315 0s. 2d., (1913) £297,682 0s. 5d.; reserve for protection of policyholders, (1903) £916,808 4s. 5d., (1913) £3,114,106 17s. 0d.; assets, (1903) £1,055,479 16s. 8d., (1913) £3,614,078 12s. 2d.; surplus over capital stock and all other liabilities, (1903) £66,013 9s. 1d., (1913) £312,120 9s. 11d.

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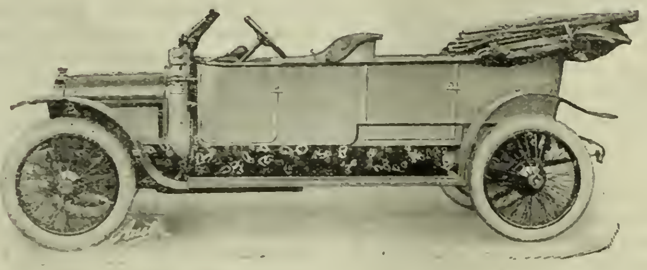

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AUTOMOBILE NOTES.

Light American cars, especially Fords, find favour in the North-West Districts of the Colony and in German South-West Africa, where the roads traverse extensive sandy tracts. A correspondent states he has accomplished 20,000 miles during the last 18 months in his Ford with no repairs except one front spring. The output of these cars from the combined American and Canadian factories during one week in February was 7,064 cars. It is this enormous output which enables the company to turn out so cheap an article.

* * * *

Mr. Leycester Barwell, of Ascot, one of the best-known men in motoring circles in England, states that it is over nine years since he entered a railway train. Since 1903 he has achieved a mileage of 154,885 miles in five cars, and with one of these vehicles, which he has had for 10½ years, and which is still running well, he has covered more than half that distance.

* * * *

In his speech at the dinner of the Royal Automobile Club of South Africa last week, the Chairman, Sir Frederic de Waal, thanked the Club, and especially the vice-chairman, for the assistance he had received in framing the regulations under the Motor Car Act. The vice-chairman, Mr. A. T. Hennessy, in his speech, in which he made complimentary reference to the services of the honorary secretary, referring to Mr. Merriman's remark that, thanks to American enterprise, he was now a motorist himself, stated that the percentage of cars imported last year into South Africa was: British, 40 per cent., and American 48 per cent.—the latter representing a sum of £540,959. He pointed out that the success of the American article was due to their specialising on one design—using the very latest machinery— and turning it out in enormous quantities. If the British manufacturer wished to obtain this trade he would have to follow suit and not content himself with making highly finished cars in a great variety of types. In regard to the £8,000 excess over estimated revenue from taxation, he would be very happy to suggest a scheme for making an equitable redistribution among motorists! This sum, however, was a mere bagatelle as compared with the revenue derived from motorists through the Customs, which amounted to nearly £200,000 in 1913. This certainly entitled motorists to a considerable say in the question of proper road construction. The vice-chairman referred to the motor fuel problem and the progress that was being made towards a solution, pointing to the vast reserves of raw material possessed in this country from which the production of benzole was possible, and to the deliberations of the committee on alcohol at present sitting in London for the purpose of inquiring into its possibilities as a substitute for petrol.

* * * *

The results for the competitions held by the Transvaal Automobile Club last Sunday have now been worked out. For the club's cup competition they are as follows:—1, J. Howie (Talbot), 3,090 lbs., 12½ lbs. petrol, 3 hrs. 44 mins., 39·8; 2, B. J. Penney (Ford), 2,480 lbs., 13⅝ lbs. petrol, 3 hrs. 44 mins., 32·6; 3, D. H. Saker (Talbot), 3,410 lbs., 17⅝ lbs. petrol, 3 hrs. 48 mins., 29·6; C. Whitehead (Standard), 1,955 lbs., 13¾ lbs. petrol, 3 hrs. 47 mins., 28·7; B. J. Penney (Ford), 2,395 lbs., 15⅞ lbs. petrol, 3 hrs. 49 mins., 27·5; C. G. Saker (Talbot), 3,620 lbs., 19 lbs. petrol, 3 hrs. 40 mins., 25·5 (penalised 10 per cent.); F. C. Simmonds (Buick), 3,245 lbs., 21¼ lbs. petrol, 3 hrs. 51 mins., 23·9; J. Howie (Talbot), 3,580 lbs., 22⅝ lbs. petrol, 4 hrs. 3 mins., 23·6; J. Sander (Hupmobile), 3,115 lbs., 24½ lbs. petrol, 3 hrs. 17 mins., 20·3; C. Whitehead (Studebacker), 4,580 lbs., 35½ lbs. petrol, 3 hrs. 49 mins., 17·1. For the motor traders' cup competition, the following are the results:—1, J. O. Lucas (Talbot), 3,415 lbs., 15 9-16 lbs. petrol, 3 hrs. 39 mins., 33·5; 2, H. W. Kelly (Ford), 2,495 lbs., 13¾ lbs. petrol, 3 hrs. 50 mins., 28·3; 3, W. Wilkinson (Ford), 2,110 lbs., 15 lbs. petrol, 3 hrs. 51 mins., 27·3; P. H. Lazarus (Oakland), 3,860 lbs., 22 lbs. petrol, 3 hrs. 58 mins., 25·2; F. W. Duquemin (Vauxhall), 3,920 lbs., 22½ lbs. petrol, 3 hrs. 37 mins., 24·8; J. G. Beatty (Talbot), 4,595 lbs., 25⅝ lbs. petrol, 3 hrs. 51 mins., 23·6; W. Wilkinson (Sunbeam), 3,635 lbs., 19½ lbs. petrol, 4 hrs. 15 mins., 23·4 (penalised 10 per cent., and delayed by tyre trouble). Disqualified: A. F. Bowerman (Morris-Oxford), Dr. Brinton (Ford), H. H. Morris (Buick).

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INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

May 6.—Van Dyk Proprietary; Lancaster West; Tudor; Modder Deep Levels; Geduld Proprietary; Princess Estate; May Consolidated (annual).

May 15.—Bucks Reef (special); Marievale Nigel; Wit. Deep (annual).

May 20.—Apex Mines, New Kleinfontein (Annual).

May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).

May 27.—Consolidated Langlaagte Mines; Ginsberg; Glencairn; Government Areas; New Primrose; New Rietfontein; New Unified; Van Ryn Deep; Witwatersrand G.M. (annual).

May 28.—West Rand Consolidated; Roodepoort United; New Goch; Meyer and Charlton (annual).

May 29.—Cloverfield; Vogel. Deep; Knight Central (annual); Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries; Sacke Estates (annual).

June 2.—Modder. B.; Bantjes (annual).

June 3.—Crown Mines; Durban Roodepoort Deep; Village Deep (annual).

June 17.—S.A. Gold Mines; Leeuwpoort Tins; African Farms.

June 22.—Robinson Deep (annual).

June 23.—Transvaal Consolidated Lands (annual).

June 30.—A. Goerz & Co., Ltd. (annual).

A. Goerz & Company, Limited

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NOTICE is hereby given that the FIFTEENTH ORDINARY GENERAL MEETING of Shareholders in A. Goerz & Company, Ltd., will be held in the Board Room, Silesia Buildings, Main Street, Johannesburg, Transvaal, on TUESDAY, the 30th JUNE, 1914, at 11 a m., for the following purposes:—

1. To receive and adopt the Directors' Report and Accounts for the sixteenth financial year of the Company, ended on 31st day of December, 1913.

2. To appoint Directors in the places of Mr. Amandus Brakhan and Mr. Max Steinthal, who retire in accordance with the provisions of Article 74 and being eligible offer themselves for re-election.

3. To appoint Auditors in the places of Messrs. Price Waterhouse & Company and Messrs. F. W. Diamond and English, who offer themselves for re-election, and to fix their remuneration for the past audit.

4. To transact any business which, under the Articles of Association, may be transacted at an Ordinary General Meeting

Holders of Share Warrants to Bearer are hereby informed that for the purpose of attending or voting at the Meeting, either in person or by proxy, their Share Warrants must be deposited (together with a statement in writing of the names and addresses of the Holders of the Warrants) at any one of the following offices of the Company.—

JOHANNESBURG.—Silesia Buildings, 94, Main Street, (not later than 17th June.

LONDON.—Pinners Hall, Austin Friars, E.C (not later than 28th May.)

PARIS.—25, Rue de Clichy (not later than 26th May.)

For Share Warrants so deposited a Certificate will be issued entitling the holder to attend and vote in person or by proxy at the Meeting in the same way as if he were a registered member of the Company. The Share Warrants deposited in Johannesburg will be released at any time after the Meeting, and those deposited in London or Paris will be released on and after the 15th June, 1914.

The Transfer Books of the Company will be closed from the 30th June to the 14th July, both days inclusive.

By Order of the Board,

VERNON J. RONKETH,
HENRY CLARK,
Secretaries.

Silesia Buildings, 94, Main St., Johannesburg, Transvaal.
Pinners Hall, Austin Friars, London, E.C. 29th April 1914
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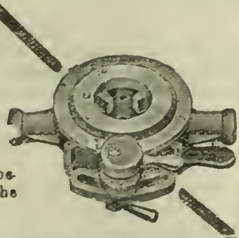

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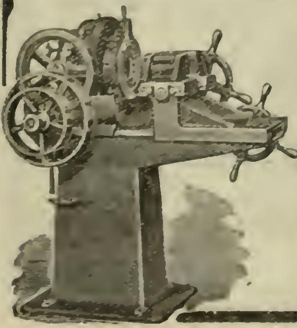

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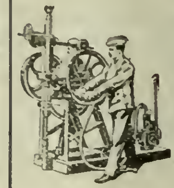

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G. D. RAINIER,
Under-Secretary for Justice.

14th April, 1914.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

CONTENTS.

PAGE
Notes and News 263
Topics of the Week:
The "Colour Bar" and the Government 265
The New Tariff, Local Industries, and the Cost of Living 266
Position and Prospects of the Goerz Group 266
The City Deep's Strong Position 268
Progress of Mining in Rhodesia 269
Union's New Taxation 270
Mineral Development in the Victoria District 270
Pilandsberg Diamonds 271
The Making of Mine Models as a Technical Question ... 272
State Aid to Mining in Other Mining Countries 272
The Year with the Robinson 273
The Year with the Albu Group 274
What is Wrong with Rand Mining? 276
The Foundations of the "Colour Bar" 277
Relation of Geology to Mining—III. 278
Incidence of the Income and Land Taxes 279
Grade, Costs, and Profits in March 280
Rhodesia Gold Mining and Investment Company ... 280
The Application of Efficiency Methods in Mining ... 281
Rhodesian Section:
Latest Mining News 282
The April Output: Group Returns 284
Engineering Notes and News 285
Recent American Machine Design 285
Steel v. Cast-Iron Pipes 286
The Week in the Sharemarket 288
Finance, Commerce and Industries 289

Notes and News.

The Prospector Controversy.

Those who participated and those who were interested in the discussion that has recently been proceeding in these columns on the subject of prospecting will probably mark the view of Mr. E. W. S. Montagu, the Secretary for Mines in the Administration of Southern Rhodesia, that with a view to exploiting new districts prospecting parties should be sent out under the supervision of qualified mining engineers, who would see that their work was properly carried out. There are prospectors and prospectors, and as a class we have nothing to say against those men who have borne the heat and burden of the day in the exploitation of so many mineral fields. But the fact that Mr. Montagu is scarcely flattering in regard to prospectors and prospectors' methods is not without interest. The statement of the Rhodesian Secretary for Mines on this point is weighty and undoubtedly strengthens the hand of the correspondent who in recent issues of this journal has signed himself "A One-Time Mug."

* * * *

Old Stopes and Mine Lives.

A feature of mining in the Germiston area at the present day is the large amount of ore that is being recovered from old or abandoned stopes. The stone which the original builders of the Rand industry appear to have rejected, although it is scarcely destined to become the head of the corner of the edifice of the Main Reef series, is nevertheless going to prove a very material factor in the prolongation of mine lives, and particularly is this so in the case of a number of propositions in the Near East section of the Rand. One or two mines under Barnato control are reported to be doing notably well in this respect. The New Primrose and the Witwatersrand, for instance, are understood to be deriving a very substantial tonnage each month from old stopes, and in the Germiston district a considerably longer life for the New Primrose mine than has generally been estimated is being spoken of, mainly as a consequence of this satisfactory "cleaning up" of the mine.

* * * *

Oil Shale and the Del Monte Process.

Mr. J. A. Greene, of the Cape to Cairo Oil Shale Development Co., Ltd., is returning to South Africa, with the intention of floating a subsidiary of that company. Meanwhile, the Del Monte process is being boomed in London in connection with South African oil shale. The Del Monte process, according to the London papers, appears to be the solution of the South African oil-shale problem, and future developments will be awaited with keen interest. Mr. Cunningham Craig, in a letter to Mr. J. A. Greene, in allusion to this process in conjunction with a property brought before his notice, says, "In the operation of your African shale properties, I should advocate the adoption of the Del Monte process, by the utilisation of which you may, in my opinion, rely upon a net working profit of approximately 15s. per ton of shale treated."

* * * *

Durban Roodepoort Cold.

Notwithstanding that 192,000 tons of ore were mined last year at the Durban Roodepoort, ore reserves are now estimated at 630,212 tons, or 30,000 tons more than the amount of last year, this difference being represented by the inclusion of portions of reef formerly looked upon as unpayable but which can now be profitably treated. The financial results for the year have been satisfactory, especially taking into consideration the state of unrest under which operations had to be carried on during the second portion of the year. The credit balance from 1912 was £25,483, and the net profit for 1913 £35,612. Dividends absorbed £31,365, leaving a credit balance of £29,731. The total amount of dividends paid since the formation of the company amounts to 1,125 5-6 per cent., or nearly £1,400,000.

New Rand.

Mr. A. R. Sawyer has issued a report on Nos. 18 and 19 boreholes of the New Rand, Ltd. He considers that the probability of intersecting the reefs in No. 20 borehole is very great, and enters fully into the evidence which influences him in coming to this conclusion. The reason of No. 19 borehole failing to intersect the reefs was due to the duplication of the strata. He points out that this duplication could not have been foreseen by anyone, and had no adverse bearing on the question of the existence of the reefs. No. 20 borehole was started on the 2nd inst., and had reached a depth of 54 ft. on the 4th inst. Mr. Sawyer arrived in England on the 31st March.

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Nickel in Madagascar.

According to the "Echo des Mines," an English company has been formed to exploit deposits of nickel ore containing 4 per cent. of nickel situated in the neighbourhood of Ambositra. The ore occurs as garnierite. The company possesses a 10,000 h.p. water power four miles distant. The transport of the ores will be made by water at a cost of 50s. per ton, with an addition of 44s. to 48s. freight to Marseilles.

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Harmony Estate Mining.

Speaking at the recent annual meeting of the Harmony Proprietary in London, the Chairman said:—"I am informed that a large portion of the Estate is admittedly the best mineralised track of country outside Johannesburg. Gold reefs are known to exist on 10 farms, whilst on others alluvial gold, copper, tin, wolfram, iron, and mica exist, and are likely to prove of considerable extent and value, and from the working of these on a scale justified by their merits, very handsome profits are likely to be earned for the shareholders. Additional important finds will no doubt be made on some of the other farms when systematically prospected. In fact, reports have recently reached the directors of new gold discoveries made by prospectors anxious to obtain mining concessions from the company; moreover, two mining companies of importance are about to be formed by those holding concessions from us in which this Company will obtain large share interests in addition to substantial rents and royalties. A concession on terms favourable to this Company to prospect for tin with the right to locate within a given time a certain number of tin claims has also recently been arranged. There are several ways in which this Company can reap its profits, viz., by letting the mining claims on rents or in the case of the mynpachts, on rents and royalties, or taking a rental and a proportion of the shares capital of any Company formed to work the respective claims, or by forming the sub-companies ourselves and making our profits in that way. No doubt we shall use all these means of developing the mineralised area of the estate.

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"Safety First."

We know of no "safety bulletin" published that is so well calculated to get the attention of the men to whom it appeals and thus to perform the most difficult task of inculating safety-first principles among employees, as that issued by the Nevada Consolidated. We quote below the last part of a short article in the February number, as interesting for its technical figurative language as for its truth: There is more real poetry, more genuine sentiment and sincerity in the few brief words with which the recommendation is clothed than in any suggestion the safety department could make: "To the Safety Department: How to prevent accidents—close the ——— ——— saloons.—Roaster Plant."

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A Strike That Failed.

The copper miners' strike at Calumet, Michigan, which has been in progress for nearly a year, has collapsed, and the miners, numbering 18,000, are seeking re-employment, having waived all their demands. The strike, which was organised by the Western Miners' Federation, has been responsible for rioting, bloodshed, and damage to property, but throughout the mineowners have steadfastly refused the union's demands for recognition and higher wages. Strikebreakers were imported, including 300 Cornishmen, two of whom were murdered by the strikers last year. The great majority of the men will find their positions filled up, and the owners show no disposition to discharge the imported miners, who have now settled down to local conditions. It was at Calumet that the fatal panic on Christmas Eve occurred, owing, it was alleged, to a drunken non-unionist shouting "Fire!" in a hall where a miners' entertainment was being given. Eighty-three men, women and children lost their lives, but a couple of days afterwards Mr. Moyer, the miners' leader, was expelled from the town on account of the violence of his language and the wildness of his accusations.

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Tin Prices.

The price of tin goes on merrily receding, to the consternation of tin mining shareholders. The cause is difficult to fathom, but if it be true that bears are at work, their lives would not be worth many hours' purchase if they fell among some irate tin people we know.

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Rock Drill Practice.

Mr. H. A. Guess, in a Paper before the American Institute of Mining Engineers, says:—Less than 5 per cent. of the drills of the firms operating in the South-Eastern Missouri (U.S.A.) mining district are now run with two men, and it is probable that within another year nothing but one-man drills will be in use. The type first adopted by those companies was the Sullivan. Within the past year, however, faster cutting drills than even the 2.25-in. Sullivan have been sought, and as a result one company has adopted water Leyners throughout, while two other companies are using the Ingersoll C-110 2.75-in. Butterfly-valve drill for a large part of their work. Attention has also been given of late to the large amount of time consumed, particularly in tripod work, in setting up, even with the one-man drill, and several of the companies are, therefore, beginning now to use hammer drills of the self-rotating type for down holes and even for lifters. These hammer drills for holes of not over 8-ft. depth will drill full as fast as piston drills, and no time is consumed in setting up, while the air consumption is only about one-half that of a 2.75-in. piston drill. Approximately 29 ft. of holes are drilled per shift per single machine, and approximately 1 ton is broken per foot of hole. Power costs, as compressed air for drilling, are approximately 2½d. per ton, and explosives 4d. Air is distributed to the drills at about 80-lb. pressure.

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The Central Mining Year.

The Central Mining and Investment Corporation has declared a net profit of £417,393 for last year. The present reserve fund will be appropriated and added to this amount. It is proposed to write off £555,275. The value of holdings was seriously affected by the continued unrest in Europe and elsewhere, and the industrial troubles in South Africa and the consequent shortage of native labour. For this reason the profit earned is not available for distribution.

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Where the Gold Goes.

The report of the Royal Commission on Indian Finance and Currency, which has just been issued, settles some controversies and starts others, but it does not clear up the mystery of the hoarded gold of India. From time immemorial India has absorbed gold as a sponge absorbs water. The flow of gold to India has always continued. In the last twelve years she has received £136,000,000 in gold, partly in sovereigns and partly in bullion, in addition to enormous quantities of silver. It all goes into the country, but very little comes out. Lord Rothschild observed some years ago that he had noticed that none of the smooth gold bars sent to India from this country ever came back. What happens to this great stream of precious metal, which continuously disappears like those rivers in the desert lands which lose themselves underground? The testimony of experts is most conflicting. Some say it is hoarded, while a few are ready to prove by a formidable array of statistics that it cannot be extensively hoarded. Those who believe that India possesses a vast store of hoarded treasure make the wildest guesses at its probable total. The most popular estimate of the hoarded wealth of India puts the total at £300,000,000, which would amount to £1 per head of the population; but some credible estimates are far higher. The experts quarrel, again, about the probable effect of India's absorption of gold upon the world's money markets and the prices of commodities. Some say that all gold-using countries benefit thereby, while others, such as Sir Edward Holden, appear to hold that " the drain of gold to India " is a potential menace. The Commission, while declining to endorse either of these mutually destructive contentions, has declared in effect that an increased use of gold in India should not in future be encouraged by the Government, but India already seems disposed to resent this recommendation.

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The Ideal Stope Drill.

The *Engineering and Mining Journal*, of New York, wastes its sarcasm on an incomplete report of portion of a speech made by Mr. Leopold Albu at the Van Ryn meeting. It reports Mr. Albu as saying:—

> Several rock drills have been introduced on the Rand, with more or less success, but the question always has been the great cost of maintenance. Those small machines get useless in a short time, and that has proved a great drawback. The rock drills are there, but the cost of maintenance is too great at present. We are trying in one of our mines a new rock drill—the Leyner air drill—of which, up to recently, we have had quite satisfactory reports. I am quite convinced that, sooner or later, a rock drill will be established, because it will be an enormous fortune to the man who invented it, and it will prove a great saving to the companies; in fact, will bring about quite a revolution in the whole industry. Working costs will be decreased, and requirements for capital will go down one-third, and it will do away with that awful question of labour.

In the foregoing Mr. Albu was, of course, referring to a suitable small light drill. Our contemporary, however, regards him as referring to any old drill, and thus waxes sarcastic:—

> We looked carefully at the date of the publication in which this appeared, thinking it might be 1884 instead of 1914, but there seems to be no mistake. And it was only recently that one of the Rand engineers made the boast that Rand practice was the most advanced in the world! They have had "quite satisfactory reports" of the Leyner. So have we, and of the Waugh and of the Jackhammer and of a host of other good American makes and have been having them for many years. Mr. Albu's prescience in expecting that "sooner or later a rock drill will be established," which will result in a fortune to the inventor, etc., does him credit. We also are firm in the belief that the present generation will witness the practical application of steam pumps to mine drainage, and we look forward with confidence to the substitution of steam, air and electric hoists for the old *malacate* at the Copper Queen, Miami and other Southwestern mines. The recruiting of sufficient Kaffir labour is an ever-pressing problem on the Rand. We suggest a diversion of effort from the recruiting of natives to the recruiting of a few thousand of the able-bodied piston and hammer machines that can be had in this country.

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The Tweefontein Colliery.

At the annual meeting of the Tweefontein Colliery, Ltd., held in London the other day, Lord Oranmore and Browne, who presided, remarked that during the five years, 1908-1913, the mine had produced 2,510,000 tons of coal, of which 1,656,000 tons had been sold at a profit on sales of £119,922, and he considered he was justified in assuming that the results for 1913, the best up to the present, will be surpassed during the current year, unless there is further industrial unrest in South Africa. The profits for January and February show an increase of over £1,000 as compared with the profits for the corresponding months of last year. He remarked that the additional capital expenditure during the year amounted to £1,644, the outlay being in respect of drills and drilling machines, workshop tools, air piping, underground rails, and buildings. The Board has under consideration the erection of further buildings and workshops, additional water supply, underground trucks and machine tools, and extensions of electric light and haulages, the provision of which is necessary in view of the expansion of trade which is confidently anticipated. Should these works be carried out, the capital expenditure in respect of them will appear in the current year's accounts, and shareholders will note that there is ample cash available in the sum of £13,374 19s. 1d. which is carried forward from last year after the amount necessary to meet the final dividend for 1913 has been deducted.

TOPICS OF THE WEEK.

THE "COLOUR BAR" AND THE GOVERNMENT.

A FULL-DRESS debate is expected to take place in the House of Assembly next Tuesday on the question of the Colour Bar. Extraordinary interest attaches to the discussion, since it will elucidate once and for all the attitude of the Government, and clear up much that the Ministry has of set purpose kept obscure and confused in its policy. Properly to understand the present position of the question, it is necessary to review briefly recent happenings that have resulted in its being forced to the forefront as one of the vital issues of the moment. On April 1st last Dr. Abdurahman and a deputation of the General Executive of the African Political Organisation waited upon Mr. Malan on the subject of the disabilities imposed on coloured people in the Mines, Works and Machinery Regulations. The deputation laid particular emphasis on the numerous additions made to these disabilities in the revised Regulations recently issued. In his reply Mr. Malan was disposed to blame the Chinese for the additional disabilities imposed by means of the Mines Regulations on coloured people since Union. He also argued that the Regulations passed since Union had the effect only of preserving in the two northern Provinces the *status* which existed before Union. As a fact, both these arguments are inaccurate and misleading. At the time the Chinese were on the Rand coloured men and trained natives were permitted by law to do, and were doing, many things which it is illegal for them to do now. What have the Chinese to do with the numerous changes discriminating against the coloured people introduced into the Mining Regulations from 1911 up to the end of last year? As to preserving the *status* which existed before Union, this argument would be proved to be absolutely false were a careful comparison made of the existing Regulations, and of those which were in force prior to Union. The most cursory examination of the two sets of Regulations would show that under Mr. Malan's *régime* the plight of the coloured people has been greatly aggravated. No doubt the real reason for the changes adverse to the coloured people made in the Regulations since Union is the one given by Colonel Byron in a speech which he delivered last Tuesday, May the 5th, at Grahamstown. It must be plain to every newspaper reader that until quite recently Mr. Malan was doing his best to curry favour with the Labour Party, and one of the ways in which he did so was by sacrificing the coloured people. We believe that if our suggestion were adopted and a careful analysis of the Regulations as they stand to-day made it would be shown that the Union Ministry, and particularly Mr. Malan, have a greater responsibility for making concessions to the Labour Party at the expense of the coloured people than either the Kruger or Wybergh *régime*. It was the policy of concession to the Labour Party that induced Mr. Malan to register two votes (one as member of the Committee and a casting vote as Chairman) for Mr. Creswell's motion in the Select Committee on Miners' Phthisis on May 14th, 1912, adding a proviso to Section 16 of the Bill permitting the Miners' Phthisis Board to give compensation to men who have been less than two years on the Witwatersrand, which has done more than anything else to enable swindling by miners from Australia and elsewhere to be carried on under the Miners' Phthisis' Act. It is also the same policy of concession to the Labour Party that has surrounded the doings of the Miners' Phthisis Board with a mystery and a secrecy which discredits the Board and encourages men to be dishonest.

Indeed, the raising of the question of the removal of the " Colour Bar " has produced a rumpus in the Labour camp that would be amusing if the issues were not so serious. Despite the fact that Mr. Wybergh, a recognised leader of the Red Flag party, and its representative on the Miners' Phthisis Board, has made innumerable speeches and written two long articles in the *Rand Daily Mail* advocating the admission of coloured men to the Trades Unions, and despite the further fact that the last Labour Party Congress in December, 1913, at Pretoria, passed a resolution to the same effect, a strenuous opposition to the idea is now being organised on the Rand. The position to the onlooker is, certainly, puzzling. It is on record that during the abortive strike of January on the Rand the coloured workers were officially approached by the Union to throw in their lot with the white workers. Mr. Madeley, at Capetown, even declared that the coloured workers were as good as Mr. Merriman. For their support, the coloured people were given promises, which, apparently, they distrusted. Their decision is justified by the sequel. A petition presented by them, through the offices of Mr. Merriman, to the Union Parliament, praying for the removal of the Colour Bar, is to be opposed by a monster counter petition from the white workers of the Rand. This proceeding is certainly not edifying. It shows that all the professions of brotherhood by the Labour people for the coloured workers are so much bluff and bunkum, since all their fair speeches of friendship are given the lie by their present actions. The legitimate aspirations of the coloured man for, mark you, an equal right to work, not for the vote or for any form of social recognition, but simply to work up to the limit of his capacity, is to be met by an hysterical outburst from the Rand. All sorts of dreadful signs and portents are read—and by Socialists, of all people!—into the philosophic, justice-loving advocacy of the industrial emancipation of the native by Mr. Merriman, Mr. Cullen, Mr. William Blane and Mr. A. E. Payne. Some of the Labour organs even profess to see in the industrial troubles of July and January last the evidence of a diabolical Machiavellian conspiracy against the white men on the mines. Making all allowance for the extraordinary effects Socialist enthusiasm has upon some types of mind, it is difficult to understand how any sane man, conversant with the history of the Rand and with recent industrial troubles, can honestly harbour such a belief. The real facts of the case, as every regular reader of this paper knows, are capable of much simpler explanation; and in this matter the simple and obvious reading happens to be the true one. After the troubles of July and January had revealed the white workman of the Rand as not knowing how well off he was, and liable to be led by the nose by any plausible tub-thumper who happened to come along, thoughtful observers began to point out how foolish and ill-advised was such conduct on the part of the white man, in view of the specially privileged position artificially created for him by the Government and the mines. As a fact, the strike trouble was not the consequence but the cause of the raising of the colour question on the Rand.

In view of this one reads with impatience the "superior" and superficial criticism of academic Socialists, such as appears in that absurd English paper, *The New Age*, which honours us and our problems with the following bewildering notice compounded of congenital wrongheadedness, an arrogant assumption of all human wisdom, and an affectation of detachment that enables it to hunt down, discover and diagnose the obvious, with the enthusiasm of a short-sighted detective. This is what *The New Age*, this " Daniel come to judgment," says about the " Colour Bar ":—

> The imminent peril of the restoration of South Africa to a condition of black slavery aggravated by back-Dutch Republicanism is, more than the deportations themselves, the cause of the recent set-back to the Government and policy of Messrs. Botha and Smuts. And evidence has begun to accumulate that this black ideal was not only in the minds of the mine-owners, but has long been cherished among them. What has been the meaning, for example, of their perpetual cry of the "high costs" of producing gold? People do not raise a song about high costs unless they have in mind low costs with which to compare them. And what are the low costs on which the hearts of the minewoners are set? The substitution of black for white labour! In the leading technical mining journal of South Africa no longer ago than in its issue of February 28 appeared an article under the significant title of "The Passing of the Colour Bar." The article opens with the following paragraph, as straightforwardly as could be wished: " Evidence accumulates daily that the highly artificial and inequitable restriction known on the Rand as 'the colour bar' must go. Mr. A. E. Payne, the energetic ex-President of the Mine Managers' Association, put the facts very bluntly. . . . Our inquiry into the problem and possibilities of reducing working costs has brought us face to face with this cardinal fact of the industry, that the first and surest way to economise lies in the industrial emancipation of the native." And the article concludes thus: " From this would follow, as the night the day, the much desired reduction of working costs. And reduced working costs, it is now a commonplace of Rand economics, mean more capital for the country, more work for all, and general contentment and prosperity. Wherefore, the Colour Bar Must Go!" No beating about the bush there, but only a magnificent and devilish indifference to race, to country and to economic fact! Is South Africa prepared to see this mine-owners' ideal of cheap labour carried into practice and fulfilled? There are, as we say, evidences—only electoral at present—that she is not. But of what use will protest be when the white trade unions which alone stand in the way of the mine-owners are crushed by the Government to jelly?

Now, we are not so young as to be tricked into a serious attempt to repel the epithets hurled at us by *The New Age* in the foregoing farrago of clotted nonsense. Who, for instance, wants to crush the Trades Unions to a jelly—is there not a Bill before the Assembly at this moment providing for their compulsory recognition by employers? Moreover, the only claim to " magnificence " in our statement of the case against the " Colour Bar " lies in its clarity, justice, and " inevitableness." How it could be " devilish " to plead the cause of the coloured underdog on the Rand is only explicable on the " Futurist," " Cubist," or other topsy-turvy lines of reasoning peculiar to *The New Age*, and surely our race and country must be in a bad way if regard for the elementary rights of our subject peoples is to be construed as indifference to them! That our arguments are all against economic fact as expounded by that organ of the most crack-brained form of extreme Socialism, we are not surprised to hear. Our chagrin would have been great had it been otherwise.

POSITION AND PROSPECTS OF THE GOERZ GROUP.

MR. H. Neuhaus, who presided at annual meetings of the subsidiary companies of Messrs. A. Goerz & Co., Ltd., during the week, is clearly optimistic as to the reduction of working costs on the Witwatersrand. At meetings of the Tudor and Lancaster West—two concerns which, through of stress of circumstances, have had to remain idle during the past year—Mr. Neuhaus made special reference to the general outlook, which he considers is at present more favourable for a reduction of costs. Naturally, this would have a favourable effect on the two companies in question, and should tend towards the resumption of work on these two mines. Nothing whatsoever has been done at the Tudor for some years past, and in regard to the Van Dyk Proprietary, another dormant proposition under Goerz control, the only activity to be reported has been the selling of machinery at prices considered satisfactory by the Board. As to the Lancaster, however, an agreement has been signed for the treatment of the accumulated slime. In regard to the three productive subsidiaries, results were adversely affected by the strike. In the case of Geduld the direct loss due to the strike was anything up to £20,000, but at each mine the most serious result was the wastage in the native labour force resulting from the disorganised conditions, and the temporary suspension of recruiting after the July troubles. Geduld was particularly unfortunate last year, for just when the work of enlarging the plant had been completed the workmen went out on strike. This mine is now quite in a position to deliver 24,000 tons per month to the mill; only the poor supply of native labour has prevented this being achieved for several months past. In connection with this property the excellent development values met with in depth call for special notice. At the Princess the profit for last year was £16,000 greater than in 1912. Working costs at the Princess are still high, but it should not be overlooked that this is a most difficult mine to work and that it would be quite unfair to compare the costs of this property with mines more favourably circumstanced. The May Consolidated—one of the oldest and best dividend-paying mines of the Witwatersrand—has not now a long productive existence before it, the consulting engineer estimating that the company should be able to work at a profit from eight to ten months and earn a total of from £8,000 to £10,000, exclusive of the gold in the plant. Shareholders in the May Consolidated will, however, continue to be interested in the company, as it holds 25,000 Modderfontein Deep Level shares and has an option over a further 8,023 shares. There can be no question that this has been an excellent investment. The shares already stand at a substantially higher figure than they were purchased at, and a perusal of Mr. Neuhaus' remarks at the Modder Deep Levels meeting leads one to a conviction that the full value of this property has not yet by any means been realised. Briefly stated, the position at this mine is that at the end of the year about four years' ore reserves (on a basis of 30,000 tons per month) were in hand, and that this tonnage assayed 7·5 dwts. over a 73 ins. stoping width. Crushing with a thoroughly modern plant of 60 stamps and 6 tube mills will commence in about nine months time, and since development is still in progress the mine should, as Mr. Neuhaus puts it, start production with as many years' ore reserves in hand as any mine now working on these fields. Taken on the whole, the affairs of the Goerz companies must be considered as being much more satisfactory than was the case a year ago, and with the Modder Deep Levels in such an excellent position and due to start crushing shortly after the end of the year, it can certainly be predicted that the outlook for a still better situation in twelve months' time is decidedly hopeful.

THE NEW TARIFF, LOCAL INDUSTRIES AND THE COST OF LIVING.

The worst that can be said about the revised Customs tariff is that it tends to increase the cost of living. On the other hand, the best that can be claimed for it is that it encourages local industries by the introduction of a dumping clause and countervailing duties to fight bounty-fed foreign imports, and that it increases the imposts on the necessaries of life very little, if at all. To ignore the fact that it does tend to increase the cost of living would, however, be doing a disservice to the whole consuming community. Ministers expect a community to squeal when it is hurt; and to bow the neck silently to the new yoke imposed by General Smuts would possibly be misconstrued as acquiescence in a righteous innovation. It is true that some comfort may be gleaned from the fact that the Minister has more or less definitely given it to be understood that with the present changes a period has been put to tinkering with the tariff; and trade generally may count upon some measure of finality being reached. Still, the fact that the new tariff involves an impost upon the consumer greater by any sum from £150,000 to £200,000 is inexcusable. The high cost of living in the inland centres, especially the Rand, in so far as it is produced by high Customs cum railway rates is a notorious scandal; the Economic Commission confirmed it, and no one has ever attempted seriously to controvert it. It was to be expected that an effort would have been made in the present Budget to have the anomaly rectified, that the incidence of the newer and more scientific forms of taxation now introduced would have been pushed a little further, and the unscientific and inequitable Customs imposts cut down appreciably. But General Smuts has no great sympathy for the poor consumer in South African towns, and though he has treated the preposterous proposals of the Cullinan Commission Majority Report with the scant courtesy they deserve, he is still on the side of those who regard the townsman as here to be exploited. It is not necessary to labour the fact that this maintenance of the abnormal cost of living on the Rand vitally affects the life of the industry and limits its possibilities of expansion. Recent warnings and object lessons bulk too large in the public memory to admit of this aspect of the question being forgotten. It is true that reductions in railway rates are holding out hope in this direction, but that does not absolve the Minister of Finance from removing, or at least reducing, the correlated handicap of Customs taxation as well. Having registered our protest against the reactionary features of the new tariff, a word may be said for the good points which go some way to redeem the rest. Thus, the introduction of a "dumping clause" will prove a veritable godsend to our nascent industries. The dumping in South Africa of the surplus products of overseas manufacturers at or below cost has always been the great disadvantage the local manufacturer has had to fight. Indeed, Dr. Schlesinger, the managing director of the New Transvaal Chemical Company, in his evidence before the Cullinan Commission, declared emphatically that a dumping clause in the tariff would be a greater help to the local article than an increased protective duty. He showed how it was possible for an oversea manufacturer to ruin a competing local enterprise by swamping the local market temporarily with the imported article priced below cost. This is undoubtedly unfair trading, and no one will begrudge the nascent industries of South Africa their relief from this very real and considerable menace. The principle of the other countervailing duties now introduced is, of course, not new to our tariff, as sugar formerly enjoyed such a duty, but the extension of the principle to all similar cases is an innovation with which no one can quarrel. The detailed list of actual increases and decreases in the tariff is printed in another part of this issue, and with the individual items no fault can be found. The raw materials of certain industries are put on the free list; and one or two prohibitive duties are imposed on foodstuffs of a deceptive, not to say fraudulent, nature. The other changes seem trifling when regarded separately; and certainly they can by no stretch of imagination be described as involving any great additional hardships on the consumer. The fact, however, remains that our imports will cost us more; and that, as we have said, is the fly in the ointment. It may be, of course, that the incentive afforded by the revised tariff to local industries may mean increased internal production with a consequent lessening in the cost to the consumer. Should that devoutly to be desired consummation crown the new Union tariff, no one would begrudge General Smuts laying to his soul the Jesuitical unction that if he has done evil it was merely that good might come of it.

Pniel Diamonds.

The following are the returns of finds on the Pniel Estate during the month of April:—Number of diggers, 110; finds for the month exceeded £4,000, including an unusual number of large and valuable stones found on the following area:—Jacob's Rush: One 21½-carat stone, value £204 5s.; one 12½, £156; one 29¼, £365; one 77, £616. Pniel: One 15¼, £175; one 56¾, £510; one 30½, £180. Cawood's: One 13½, £47; one 11½, £107 10s.; one 10½, £157 10.; one 22½, £212 10s. Martin's Pan: One 23½, £245. Outspan: One 11½, £95. A number of moderate-sized diamonds of excellent quality were also found. The river banks in the neighbourhood of Cawood's Hope are attracting a number of the more enterprising diggers, the indications being very favourable.

Frank Smith Diamonds.

Results for the month of April were as follows:—55,100 loads treated yielded 2,060 carats, including stones of 10, 11½, 10½ and 28 carats. Recoveries for the previous three months: January, 2,310 carats; February, 2,160 carats; March, £2,503.

Mr. George Beet, the Vice-Chairman of the Diamond Fields Pioneers' Association, states that the MSS. of the history of the diamond fields is now completed, and has been forwarded to Messrs. Longmans, Green & Co., with the object of obtaining an estimate and arranging for the history's early publication. The work will be in two volumes, medium octavo size, and will contain 110 chapters and 232 illustrations collectively.

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Referring to the December strike on the Rand, Mr. J. O'Brien, who presided over the last City and Suburban meeting, said:—"It is unfortunate that on our mine as on others the men by their precipitate action have made it impracticable for the gold mining companies to re-employ all their men. A good deal has been said about 'victimisation,' but when a company's operations are stopped and its working arrangements upset twice within six months, one is constrained to feel that the company itself is the subject of victimisation. The employees of the City and Suburban have been re-engaged as required."

THE CITY DEEP'S STRONG POSITION.

Recent Improvement in Profits—Ability to Earn Much Larger Dividends—Satisfactory Developments—High Values in the Upper Levels—The Consummation of a Sound and Unerring Policy.

Good news is to hand from the City Deep mine. From an official source we learn that this property, which has always engaged a great deal of attention on account of its size, the good value of the ore disclosed, and its generally excellent prospects, has now attained to a very much better state of development than hitherto, and that steadily improving returns are to be expected unless hindrances at present unforeseen are encountered. In the upper levels of the property recent development work has disclosed ore of remarkably good value, and the sound policy pursued in regard to development has now placed the City Deep in a position which will be further improved from now onwards.

Better Profits.

The company's profits, it will doubtless have been observed, have shown marked improvement during the past few months. Thus in October the earning was £19,494 (10s. 6d. per ton), which was improved to £24,905 (13s. 2d. per ton) in December. January and February gave lower profits, £22,789 and £22,221 respectively, but in March the amount earned was £30,316, or 14s. 5d. per ton, whilst in April the profit was £35,527. The ore milled in October was 37,200 tons, and working costs were at the rate of 26s. 8d. per ton. In March 42,000 tons were crushed, and working expenses averaged 23s. 2d. Last month 41,500 tons were milled and expenses were 22s. 11d. per ton. This latter figure is still high, and it need hardly be stated that there exists abundant scope for reduction of working expenditure. Such a lowering of costs must, of course, be in large degree dependent on ability to crush more ore monthly, and this in turn is determined by the native labour position. The native labour force of the company has recently improved somewhat, but the mine as judged by the March and April figures is still a considerable way off attaining the crushing capacity of the full plant, which is 65,000 tons per month. However, it is most probable that this tonnage will in the course of a few months be closely approached, if not indeed attained. As a matter of fact, unless quite unexpected difficulties arise, the City Deep will not "go back on" its present position, and at the annual meeting to be held early in June the Chairman of the company should have a very satisfactory situation to disclose. The annual report issued a few weeks ago showed that the position of the company at the end of the year was satisfactory and strong in every way, and we understand that since the end of 1913 the company's prospects have further improved.

£4,250,000 in Ore Reserves.

It may be recalled that at the end of December last the company possessed ore reserves amounting to 2,167,650 tons of 10 dwt. value, which compared most favourably with 2,123,650 tons of 8·7 dwt. value twelve months before. Of the ore developed during 1913, 603,700 tons, or 95.1 per cent. were estimated to be payable and of an average stoping value of 52s. 11d. per ton. The City Deep is clearly well above the average in so far as "grade" is concerned, and it seems that the average recovery of the mine to date—about 35s. per ton—is well below the recovery potentialities of the mine. The value of the ore in reserve at the end of last year, it is interesting to calculate, was about £4,250,000, and it is reasonable to assume that working expenditure will at an early date be reduced to a figure which will render about half this amount clear profit. The earnings could, it is very clear, be substantially increased as from this moment were more labour available.

New Circular Shaft Half Completed.

Such good news coming from such a mine as the City Deep, which has in the past been the sport of many rumours and which has been criticised on the ground that the shafts and general development schemes were badly laid out, is most satisfactory, and quite apart from the profit aspect of the mine it is gratifying to learn that the new circular shaft situated about midway between the two rectangular pits, which when completed will greatly benefit the underground ventilation and health conditions, has now reached a distance of between 1,000 and 1,100 feet from surface, or about one-half its required depth. The acceleration of development at the mine has been pronounced during recent months, and we should say that the position to-day in regard to developed ore is even much stronger than that disclosed in the annual report. No doubt Mr. Schumacher will have something interesting to say on this point at next month's meeting. The City Deep is clearly going to become one of the most remarkable and profitable gold mines of the world.

Legal Decision Affecting Mining.

THE JUMPERS G.M. COMPANY AND ANOTHER vs. MINISTER OF MINES.

Mr. Justice Curlewis read the considered judgment of the Judge-President in this matter, heard before His Lordship and Mr. Justice Gregorowski recently, in which applicants sought an order directing the Minister to remove their names from the list of contributors framed under Section 2 of the Miners' Phthisis Act, 1912, on the ground that on the 4th of July last, owing to the exhaustion of payable ore, applicants bona fide ceased all mining operations in and about the said mines and ceased to produce dust of any nature, and therefore maintained that the Minister was no longer entitled to keep their names on the list, nor was the Board entitled to claim contributions from them for the Compensation Fund. His Lordship proceeded to review the legal position under Act 19 of 1912, and stated that if certain conditions prevailed not only had the Minister a right, but he was bound to put the mine on the list. But, in the absence of some definite indication in the Act that the Legislature intended that the moment those conditions ceased to exist the mine should be taken off the list, one could not come to the conclusion that under such conditions the Minister could be compelled to take the name off the list. There was no such duty cast on him. Section 15 (2) gave the Minister a discretion to remove the name or reduce the amount of the contribution, when the health conditions improved, but there was nothing anywhere in the Act to lead to the conclusion that in the circumstances he could be compelled to do that. In the case of the removal of a mine from the list it might well have been contemplated that other considerations might also fairly weigh with the Minister, such as the number of years it had been working. If one remembered that the Compensation Fund was merely a temporary fund, and that no mine in the position of the applicant's contributed to the Insurance Fund, it was evident that there was no very great hardship in that. A mine, after it had shut down, could be called on to contribute to the temporary fund for a short period—in no case for more than two years—a consideration which probably also weighed with the Legislature in not making provision to have the name taken off the list if it ceased working. In the circumstances the application must be refused with costs. Mr. Justice Gregorowski concurred.

Princess Estate and G.M. Co.

The working profit for the quarter ended 31st March at the Princess Estate was £5,402 1s., working costs coming to 24s. 1d. per ton. The value of the gold recovered came to £86,192 15s., or 25s. 9d. per ton. The tonnage milled during the quarter was 66,900 tons, and the payable ore developed on the reef was estimated to be 25.262 tons, averaging on the South Reef 7·8 dwts. over 25 inches, and on the Main Reef 6·5 dwts. over 41·8 inches. The expenditure on capital account came to £4,065 17s. 9d.

Roberts Victor Diamonds.

The following are the results of operations of the Roberts Victor mine for the month of April:—Washed 16,556 loads, which have yielded 1,058 carats.

PROGRESS OF MINING IN RHODESIA.

The Present Position—Instructive Review by the Secretary for Mines.

THE report of the Secretary for Mines of the territory of Southern Rhodesia (Mr. E. W. S. Montagu) for the year 1913, presented to the Legislative Council at its recent session, contains much authoritative information on the position of the mineral industries of Matabeleland and Mashonaland last year. He reports a diminution in the volume of work and believes that this is largely attributable to lack of capital. Mr. Montagu again advocates systematic prospecting on extensive lines. He points out that no new mineral areas are being opened up, and thinks that the time has arrived when a determined effort should be made to do so. "It cannot be left entirely to private enterprise," he writes, and he advocates the equipping and sending out of qualified inspectors "under the supervision of mining engineers who will lay out work and see that it is properly carried out." Elsewhere in the course of his highly instructive report Mr. Montagu writes:—

> It is gratifying, however, to note that the number of small workers is on the increase, as this class of miner contributes largely towards the exploitation of pegged mineral ground, and leads in many cases to the pegging and prospecting of further ground on the same mining belt. Though cramped at times for want of capital, the small worker in his inexpensive way of working continues to prove the value or otherwise of claims, and capital is generally found to finance a success. The progress of work on some of the bigger developing properties has been most satisfactory, and a few of them are now entering the crushing stage, which will largely increase the output of gold, and be the means of attracting more attention to the mineral possibilities of Southern Rhodesia as a field for capital and investment. The crushing mines have on the whole maintained, and in some cases improved, their outputs, and careful management as to working costs has resulted in the payment of dividends. Better machinery has been brought into use on some of the bigger mines, and good reduction results obtained, but the wants of more capital in others has prevented the management from obtaining the results they consider the mine should yield. Extensive development and the best class of plant are two requisites for successful mining, and sufficient capital is required for both. It is satisfactory that the total of the gold output again shows an increase, and the industry is now on the eve of a very appreciable addition to the values of the annual outputs. With the railway facilities which now prevail in the country, or are under consideration, the successful working of propositions which could not have been undertaken otherwise is assured, provided, of course, that a careful watch is kept on expenditure and the mine is not over-weighted with too expensive plant. The varieties of ore which have to be dealt with in this country are more thoroughly understood, and the most suitable plant for extraction is better known. During the year under review the completion of the broad gauge railway to the Eldorado Mine, in lieu of the narrow gauge which previously served the district, was carried out, and a commencement made in extending the railway from the Eldorado Mine to Sinoia, which will prove of great benefit to the mines on the north side of the Hunyani River, as also to farmers and residents on that side. The number of producers of gold in the year was not only well maintained, but slightly increased, as compared with the previous year, and this is a gratifying feature, as it shows that mining is a popular industry in the country. Some of the producers' operations were on a small scale, but in such cases, even though on a limited stamping capacity, the value of mineral ground has been tested, which may lead to further developments. In 1912 there were 474 gold producers, and in 1913 the total increased to 488. Of this total no fewer than 445 producers worked for profit under the terms of Ordinance 10 of 1907, which allows of claims being worked on the royalty basis instead of commutation of the British South Africa Company's interest by shares. This would point to the fact that the royalty terms are more popular than commutation, especially amongst the small workers, as, included in the claims so worked, there were a number of old blocks in regard to which the claimholder had the option of working for profit under either system. The remaining 43 producers dealt with quartz from commuted claims. The gold production again shows an increase, and it may be noted here that since 1904 there has not been a decrease in the annual gold production, except in 1910, when the total was less than that for 1909. The industry had again to contend, in some parts of the country, with the serious drawback of a short rainfall, which necessitated the temporary suspension of the full capacity of crushing plant. The rains came late in the year, and at one time it seemed as if a number of mills would have to be hung up, but the careful conservation and re-use of such water as was available enabled mine managers to continue their crushing operations, even though in some cases with reduced stamping power. The question of afforestation in connection with rainfall has attracted attention, but without any concerted steps being taken to plant trees on an extensive scale. The use of coal at the mines is becoming more and more prevalent, but the cutting down of the indigenous timber for fuel is still proceeding in many parts of the country. In addition to the consideration of the possible effect such action may have on the rainfall, the quantity of good timber required for props, timbering and lagging in mines is being depleted, and, unless systematic planting of suitable timber trees for such purposes is soon undertaken, the mining industry may in a few years be compelled to import such necessaries at a heavy cost. The extensive tree planting in and around Johannesburg and in other parts of the Union, chiefly eucalptus, has proved most beneficial to the industry there, and very lucrative to the planters. Some of the bigger developing properties arrived at a stage, towards the end of the year, when it was considered advisable to erect crushing machinery, as development had been pushed far enough ahead of the mills. The output from these mines will considerably increase the gold production for 1914, and I do not consider that it is erring on the side of optimism to anticipate that the gold output for 1914 will closely approach a value of £4,000,000. During 1913 the stamping power on the principal mines was well maintained, and though there have been rumours at times that this or that mine must close down on account of the mine being worked out, the crushing operations continued, and surmises as to the life of the mine have not been verified. The greatest care has been exercised to obtain the highest production possible by improved process of reduction. The small workers' mills were kept fairly continuously at work, but of course this class of worker very often has to shut down for a few months in order to proceed with development to feed the mill with quartz. The silver production of 142,390 ozs., valued at £15,106, shows a decrease of 34,142 ozs., valued at £4,906, on the previous year's output, and this is chiefly attributable to the curtailment of work at the Penhalonga Proprietary Mines, which, for many years, has been the largest contributor towards the total. The silver production is wholly associated with the output of gold, as no mine producing silver only is working in the country. The lead production also shows a decrease in value of £4,020, owing to the diminished output from the Penhalonga Mine. The output of chrome ore did not maintain the total reached in the previous year, but the decrease was comparatively small. The ore is still shipped in its rough state to Europe, as no provision has yet been made to reduce it in this country. The output was entirely accounted for by the Rhodesia Chrome Mines, Ltd., at Selukwe, and amounted to 63,383 tons, valued at £141,481, as against 69,261 tons, valued at £154,600, in 1912. The working of this mine resulted in a dividend being paid to the shareholders, but if, as is rumoured, other competitors in the Union are entering into the market, which is of a limited capacity, it is hoped that easier railway and shipping rates will be arranged for the Rhodesian industry, which at present is the only base mineral industry, outside coal, working in the country on a large scale. The coal production from the Wankie Colliery again shows an appreciable increase in tons raised and sold, and, in addition to the requirements of Rhodesia, the operations of the company have been extended to supply the Katanga Copper Mines with coke, as also the railways into Belgian territory with coal. The completion of the railway through the Mazoe district to the Shamva Mines, the broadening of the gauge to Eldorado, and extension to Sinoia, and the carrying of the railway from Umvuma to Victoria, will materially aid in the use of coal by mines in these districts, and assist in extending the operations of the colliery. The colliery is well equipped, and is prepared to operate on a larger scale than heretofore. Coal locations were pegged and registered in the north of the Lomagundi district, and it is stated that the prospecting operations revealed a good class of coal. Work ceased on the approach of the rainy season, as the locality is far removed from any village or centre, and conveyance of foodstuffs or plant is difficult; but more serious work will be undertaken in the coming dry season, and if good coal is exposed, it will prove a great boon to Mashonaland, as well as to the projected railway through Lomagundi. The coal production amounted to 243,328 tons raised, of which 173,658 tons were sold, realising £78,421. This shows an increase of 27,188 tons raised and 10,951 tons sold, with an increased value of £5,153, as compared with the figures obtained from the Wankie Colliery. There was a small production of wolframite of four tons, valued at £427, and asbestos entered again into the production of the country. The output was obtained from the King Asbestos claims in Victoria, and amounted to 290 tons, valued at £5,224. The price for asbestos has risen, and, as the fibre from the Victoria district is considered to be of good quality, an expansion of this industry may be anticipated, more especially when better transport facilities are completed to the district.

Rooiberg Minerals Development Co.

The report of the Rooiberg Minerals Development Company, Ltd., for the quarter ended 31st March, 1914, is as follows:—Estimated profit for the quarter's operations, £14,793 12s. 8d.; nett adjustments of estimated values of previous shipments made on receipt of account sales, £441 19s.; profit declared, £14,351 13s. 8d. No allowance has been made in the above statement for Government profits tax. The average price per ton ton of metallic tin on which the quarter's revenue has been determined is £179 11s. Number of stamps running, 10; number of days run, 84·273. Tons treated: Quarter ended 31st December: From mine, 8,304 tons; sands and slimes re-treated, 2,022 tons; total, 10,326 short tons. Quarter ended 31st March: From mine, 7,188 tons; sands and slimes re-treated, 3,129 tons; total, 10,317 short tons. In the report issued for the quarter ended 31st December, the tonnage treated was incorrectly stated. The figures are now corrected above. Concentrates produced, 318 long tons. Accumulated tonnage not yet re-treated, 22,071 short tons; estimated average assay value, 2·5 per cent. metallic tin. The capital expenditure for the quarter was £1,304 15s. 6d. The result of the quarter's work shows no special features other than a decline in the number of supplementary fillings available for stoping above the 110 feet level.

MINERAL DEVELOPMENT IN THE VICTORIA DISTRICT.

Chrome Iron and Asbestos Discoveries—Larger Schemes Mooted.

ALTHOUGH in the outlying mineral districts of the Union of South Africa no very remarkable indications of activity in regard to minerals are at present evident, and although in Rhodesia as well exploratory activity appears to be at a very low ebb, it is noteworthy that there is one district in Rhodesia which at present constitutes a decided exception to this general spirit of apathy in regard to outlying areas. In his report to the Legislative Council, the Secretary for Mines for the territory of Southern Rhodesia referred to the fact that no new mineral discoveries were being made and that no new mining districts of any extent were coming forward. The exception to Mr. Montagu's general statement is perhaps provided by the Victoria District, where, so it is understood, important developments are on the tapis in regard to base metals, particularly chrome iron and asbestos, whilst it is furthermore reported that a promising discovery of tantalum has been made. Our Salisbury contemporary, *The Rhodesia Herald*, has the following interesting article on these discoveries in the issue dated April 27:—

During the past few weeks various rumours regarding a mining discovery of tremendous value have been in circulation throughout Rhodesia. From enquiries there can be no doubt that these rumours were well founded, and from authentic information received it would appear that one of, if not the most valuable asbestos fields, has been discovered in the Mashaba district, 25 miles to the west of Victoria Township. The peculiar value of the property lies in the remarkably good analysis and the high quality of the fibre, as also the ready manner in which the fibre separates from the rock, the latter being so soft that the fibre is never frozen to it. We understand that the minimum output of fibre per native per day is 100 lbs. On the newly-discovered field many of the boys are producing no less than double that quantity. The largest asbestos firm in the world, the Bells Asbestos Company, have contracted to take the whole of the output. This contract expires in February, 1916. After that date it is anticipated that a much more favourable contract will be arranged. A number of our leading engineers have reported most favourably on the property, including Mr. Ackermann, Mr. Clement Dixon, Mr. Colin Campbell and Mr. Kenrick. They are all, without exception, most enthusiastic regarding the potentialities of the discovery. The percentage, as worked out in the quarry area alone, is something like 6 per cent., while the figures given of the estimated profit in sight, after reducing such estimate by half, amounts to what can only be characterised as a huge sum. It is interesting to note what that eminent authority on chrysolite asbestos, Fritz Circel, has to say regarding the probability of this vast area continuing in value to depth. Circel points out that wherever there is a large lateral extension of serpentine, and in the serpentine an asbestos pay shoot, the lateral extension of which on the surface is more than 100 feet in both directions, this pay sheet almost invariably continues in depth. The various authorities quoted by Circel show that the quantity and quality found on the surface may be expected to be found to any depth. Circel also points out the difficulties of working on the Russian fields owing to heavy overburden, forest and marsh land. This new Rhodesian field rises to a height of 800 feet within the claims, and is considered an ideal proposition for economical working. With the opening up of such a gigantic asbestos mine there is bound to be the creation of a large local trade in the manufacture of asbestos slates and shingles. This trade has made such enormous strides in late years that Circel estimates that within a very few years it will monopolise 75 per cent. of the world's output of asbestos. Adjoining this extraordinary discovery of asbestos is an enormous chrome iron deposit. We have seen photographs showing massive boulders of the mineral lying all over the surface. One of these stones alone contains 50 per cent. of sesqui oxide of chrome, and is computed to weigh over 300 tons. There is undoubtedly a vast area of high-grade chrome. In all probability a railway line to the foot of the huge deposit will be an accomplished fact, and if the optimism of the engineers proves correct there can be no doubt that the discovery will mark a great and important epoch in the mining history of the territory. Certain influential residents throughout Rhodesia have taken an interest in the company that is about to be floated in London. Applications for shares may be made to the local secretaries, the South African and General Investment and Trust Co., Ltd., Union Buildings. The issued capital of the company will be £125,000. We understand that only a limited number of shares are available for subscribers in Mashonaland.

UNION'S NEW TAXATION.

Customs Tariff Revised—Income and Land Taxes—How the New Imposts Will Apply—Protection for Local Industries—The Much-Desired Dumping Clause—Alterations Fully Explained.

THE resolutions, for the consideration of which the Minister of Finance moved that the House of Assembly go into Committee of Ways and Means, are four in number, and deal respectively with Income Tax, Land Tax, Excise Duty and Customs Duties. An Excise duty is to be imposed on all matches manufactured in the Union at the rate of six pence per gross of boxes, each containing more than a hundred matches, at the rate of sixpence per gross of a hundred matches. The following is the new valuation clause in respect of Customs duties:—"That for the purpose of estimating the amount of Customs duty prescribed by the tariff whenever levied on goods the ad valorem value for duty purposes of those goods shall be taken to be the true current value for home consumption in the open market for similar goods in the principal markets of the country from which and at the time at which the goods were imported, including carriage to the port of shipment and cost of packing and packages, provided that in no case shall the value for duty, as in this paragraph defined be less than the cost of the goods to the importer at the port of shipment."

DUMPING DUTY.

The resolution dealing with Customs includes the following dumping clause:—"(1) In the case of goods imported into the Union of the class or kind made or produced in the Union, if the export or actual selling price to the importer in the Union be less than the true current value aforesaid of the same goods when sold for home consumption in the usual and ordinary course in the country from which they were exported to the Union at the time of their exportation thereto, there shall, in addition to the duties otherwise prescribed be charged, levied, collected and paid on those goods on importation into the Union a special Customs duty (or dumping duty) equal to the difference between the said selling price of the goods for export and the true current value thereof for home consumption aforesaid. (2) When a bounty is granted in the country of origin on any goods, an additional Customs duty, equal to the amount of such bounty may be charged, levied and collected upon the importation of those goods into the Union." It is laid down that goods to which dumping duty may be levied and additional countervailing duties against bounties shall be notified in the *Gazette*.

INCOME TAX.

It is proposed to levy income tax on incomes exceeding £1,000, arisen or accrued to any person or company wheresoever residing from any source whatever in the Union during the twelve months ended 30th June, 1914, and during the twelve months ended 30th June in each succeeding year. From each income liable to the tax of £1,000 shall be deducted and the balance over and above the £1,000 deducted will be the taxable amount. The resolution reads as follows:—"Rates of income tax in respect of the taxable amount of any taxable income shall be as follows: (a) Where the taxable amount is £1, the rate of income tax shall be sixpence. (b) As the taxable amount increases, the rate of income tax per pound of the taxable amount shall increase uniformly at the rate of one two thousandth of a penny for each pound of the taxable amount until the taxable amount is £24,000, so that in respect of the taxable amount of £24,000 the rate will be a shilling and sixpence for every pound of the taxable amount. (c) Where the taxable amount exceeds £24,000 the rate of income tax shall be one and sixpence for every pound of the taxable amount."

THE LAND TAX.

The proposed Land Tax, which is also to be levied from and after 1st July, 1914, is on the unimproved value of land outside the limits of jurisdiction of municipalities and other urban local authorities. For the purposes of this tax, the unimproved value will be taken to mean the sum which the land might be expected to realise if offered for sale on such reasonable terms and conditions of sale as a bona fide seller would require, assuming that improvements (if any) thereon did not exist or had not been made. Every owner of such land, exceeding ten thousand morgen in extent, the unimproved value of which exceeds £10,000 sterling, will be liable to a tax on so much of such value as exceeds £10,000. The person or company liable for the tax will be that person or company which owns the land on the 30th June, 1914. From the unimproved value of any land taxable, each owner will be allowed a deduction of £10,000 and the balance over and above £10,000 will be taxable value. The land tax is graduated in the same manner as income tax, rising from a penny in the pound on the first pound by additions of one thirty thousandth of a penny for each taxable pound until it reaches fourpence in the pound for taxable values of £90,000, at which rate it remains for land exceeding that value.

CUSTOMS TARIFF CHANGES.

A Customs White Paper showing the details of alterations in the proposed tariff are numerous. The duties on butterine compound, lard, etc., have been raised from 2½d. and 1¼d. to 3¼d., with the exception of butter and lard, which remain at the old rates. The duty of 6d. per lb. is imposed on cheese made from skimmed milk, and this is intended to be prohibitive. The cocoa duty is altered in order to allow raw and partly manufactured materials for local manufacture to come in at the reduced duty, the manufactured article remaining as before. The duty on mixed coffee has been raised by 1d. per lb. to 3d. The alternative duty of 25 per cent. ad valorem is levied to catch more expensive articles of confectionery. A rated duty for eggs, which is computed to be equivalent to the ad valorem rates of 15 per cent., has been imposed. A duty of 5s. per 100 feet is levied on bioscope films, as their value cannot be determined. A prohibitive duty of 6d. per lb. is imposed on adulterated and loaded leather to stop importation. For motor spirit a duty of 2d. per gallon (increase rate of 1d. on the present rate) has been imposed for revenue purposes.

THE IMPORTED CIGARETTE.

The Customs duty on lubricating oils has been altered from 15 per cent. to 3d. per gallon, owing to the fact that the value of these oils cannot be satisfactorily ascertained. Tea, when imported in bulk, is not subjected to change, but an extra penny per lb. is imposed when imported in small packages. An extra 6d. per lb. is imposed on cigarettes and unmanufactured tobacco, but there are no other alterations as regards tobacco. The duty on varnish is made 2s. per gallon instead of 15 per cent. This is an increase, as varnish usually contains a large amount of spirit. Mineral waters are transferred from the 25% rate to a special duty rate of 9d. and 1s. per dozen, according to size. There is no increase on printed matter, but items are readjusted in a more detailed and explicit manner. An increase is made on bioscope machines, gramaphones, etc., from 15 to 25 per cent. for revenue purposes. The classification of blankets, rugs, etc., is slightly altered so as to eliminate cotton bedspreads and to include hair rugs. The duty on clothing, bespoke and ready-made, is increased from 15 to 25 per cent. to assist local manufacturers. A similar increase, but for revenue purposes, applies to gold and silver plate and plated ware, jewellery and tobacconists wares.

AIDING LOCAL MANUFACTURES.

Cotton and hair shawls are subjected to the same duty, 25 per cent. ad valorem, as woollen ones. In a number of instances the duty of 15 per cent. has been reduced to 3 per cent. to assist local manufactures, namely, for canvas, amber for pipe-making, hair for broom and brush-making, saddlery and harness furniture. The only change in duty as regards metals is a reduction from 15 to 3 per cent. for aluminium. Paper duty is remodelled to conform with the new scale for printed matter and to include tissue paper for packing fruit. All ropes will be admitted at 3 per cent. The same applies to all wire, the cause being the impossibility of differentiating between various kinds. In regard to cooperage, there is a reduction from 3 per cent. to free in the case of staves and vats of foreign origin, and from 15 per cent. to free in the case of fashioned hoop iron and steel. All dyestuffs and tanning substances for leather are admitted free of duty. Crude glycerine is reduced from 3 per cent. to free to encourage local refining.

PILANDSBERG DIAMONDS.

Suspension of Operations at Saltpetre Pan—Dr. Wagner's Report and Conclusions.

It has been no secret for several weeks past that the Pilandsberg Diamond bubble has burst, but the hopeless position of that company's property on the farm Saltpetre Pan is brought home to unfortunate shareholders more clearly by the reports of Dr. P. A. Wagner and Mr. W. Murray than by any other statements that the Board has issued. In a circular to shareholders just issued, the secretary writes:—

> Your directors beg to enclose copy of report, dated 13th April, 1914, by Dr. Wagner, who visited your property in an advisory capacity, and also copy of report by the manager, Mr. W. Murray. These reports speak for themselves, but particularly evolve the two following facts: Firstly, that given a mine of the largest size, diamonds are not there in payable quantities; secondly, that were the diamonds there, the area and quantity of ground that seemed available has not eventuated. You will remember that in the month of January last a test washing of 430 loads was made, yielding 47 carats, equal to 10·9 carats to the 100 loads. When this test was made it was claimed that the gear was inefficient and unsuitable to the character and nature of the ground. The erection of a tube mill was advised, and that mill is standing to-day in Tarry's yard ready for erection. Mr. Murray, on taking over the management, claimed that he could treat the ground easily with the gear as it stood. You have his report on ground treated, and diamonds found, which under any circumstances could not justify the further expenditure of money. As to the area of ground available, it is now abundantly clear at all points, that the occurrences at surface, which are quite unique, cut out at depth, and practically become valueless from the mining or diamond-carrying point of view. With these facts before the board, they decided to discontinue all operations at Saltpetre Pan and to concentrate their attention to the other interests held by the company.

In his first report Dr. Wagner deals with the geological aspects of the farm, and concludes this with the following significant remarks:—

> Mining and washing operations in connection with the "main" dyke have been practically confined to the so-called central area, which appears to have been of the nature of an elongated body of kimberlite, having a length of about 300 feet and a maximum width of 42 feet. The exact character of this mass of rock cannot now be made out, but it was probably formed by the intrusion of two short, thick sills of kimberlite along the planes of stratification of the surrounding dwyka shale. It contracts very rapidly in depth, and on the 32 ft. level is only from 3 to 10 feet in width. The yellow ground constituting the northern portion of this body of rock is stated to have yielded 20 carats of diamonds per 100 loads. The kimberlite exposed in the central and southern sections, which differs from that found at the northern end in being more highly micaceous and in containing far less deposit, appears on the other hand to be practically barren, inasmuch as a careful test washing, by Mr. Murray, of 1,932 loads of ground, consisting principally of this highly micaceous kimberlite, only yielded an average of 1·35 carats per 100 loads. Work on the central area has been abandoned, and it is now filled with water to within about 20 feet of the surface. To the south of the central area there is another enlargement of the dyke, but here the shrinkage of width with depth is so marked that no attempt has been made to work the occurrence. Apart from the foregoing, prospecting operations have failed to disclose the existence of any considerable bodies of kimberlite in connection with the "main" dyke, and I am perfectly satisfied, as a result of my investigations, that there is no pipe along this line of fissure. In conclusion, I should like to express my appreciation of the highly efficient and thorough manner in which operations have been conducted since Mr. Murray took charge of the property. That all his work should have been in vain is certainly a matter for regret, but, on the other hand, there is considerable satisfaction in knowing that the ground has been given a thoroughly fair trial.

Under date April 13th last, he wrote to Mr. J. Dale Lace as follows:—" As a result of may second visit to the farm Saltpetre Pan, I have no hesitation in recommending that all work on the so-called 'main' dyke be forthwith suspended. This extraordinary intrusion has now been carefully prospected over its entire length—a distance of over three miles—and I am perfectly satisfied from a study of the sections afforded by prospecting pits, trenches, and cuttings, of which there are several hundred, that there is no economically important occurrence of kimberlite along its course." These documents are accompanied by a report by Mr. Wm. Murray, the manager, who summarises his conclusions as under:—" I have carefully considered the whole position. Our efforts to discover a pipe have proved fruitless, and we have proved the fissure itself to be valueless, and I would now strongly advise you not to spend any more money on the venture, and to stop all operations at once—though to myself it means a loss, I feel confident the course I recommend is the right one." It is only too clear that Saltpetre Pan must be written down as yet another diamond prospect that has proved a bitter disappointment. Earlier expectations have signally failed to materialise, and if there is still a vestige of hope left for this concern it is contained in the secretary's not particularly hope compelling announcement that the Board have now decided " to concentrate their attention to the other interests held by the company."

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THE MAKING OF MINE MODELS AS A TECHNICAL QUESTION.

Uses and Advantages of the Mine Model in Practice.

RECENTLY we wrote of the advantages of mine models for certain purposes, and referred to those of the City Deep and Messina mines. It is noteworthy that, having had occasion to construct a mine model for the elucidation of certain problems of deep sinking, a Queensland mining engineer has discovered that the literature bearing upon this somewhat important, though merely incidental, department of engineering tasks was quite meagre. Because such models are of frequent use, it was thought desirable that the subject be reduced to discussion among the members of the Institution of Mining and Metallurgy (London). The engineer here mentioned is C. O. Marks, who was operating at Charters Towers. He has contributed a description of the method adopted to suit the requirements of the district to the *Proceedings* of the Institution, appearing in *Bulletin* No. 113, February 12, 1914. At Charters Towers the ore deposits occur as shoots in numerous distinct lodes of the fissure type, a prominent feature being the tendency of the lodes to split into branches which usually reunite after a separation which often amounts to several hundred feet. The author found that most descriptions of models referred to works of glass, in which the levels were indicated on horizontal glass sheets. This method of construction was not found suitable for the demonstration of workings and ore shoots on several lodes, some of which overlap the others and each of which possesses its own angle of dip and strike. Accordingly, the use of wire was adopted as the method in the case here described.

The workings which it was desired to represent in the model [says Mr. Marks] lay within an area of 4,000 feet square, and attained a vertical depth of over 2,600 feet. A scale of 100 feet to an inch proved to be convenient to work to, while yielding a model of suitable dimensions. The block of ground to be represented contained far too many and complicated workings to be constructed as one piece, so it was for convenience divided up into unit sections of 1,000 feet cube. To act as supports for the workings in each of these units, 10-inch wire cubes were manufactured of $\frac{1}{8}$-inch galvanised fencing wire, soldered at the angles. With the aid of a template to hold the wires in position while being soldered, very satisfactory and uniform cubes could be made in from ten to fifteen minutes each, the wires being already straight and cut to length. As a preliminary to the construction of the actual model, a plan of the workings in each 1,000 feet square section was reduced, by means of a pantograph, to the 100-foot scale, on 1-10-inch square ruled paper. In Charters Towers each of the mines keeps its own levels, using the collar of its shaft as a datum; as a further preliminary, therefore, it was necessary to reduce the levels to a common datum, and for this purpose the 1,000-foot level above the sea was adopted, since it practically coincided with the collars of two of the shafts. Thus, in the model, the tops and bottoms of the wire cube units represented 1,000 feet above sea level, sea level, and 1,000 feet and 2,000 feet below sea level. To represent levels, small crosscuts, winzes, etc., 1-16-inch copper wire was used, while the main shafts and crosscuts were indicated by $\frac{1}{8}$-inch wire, brass wire being used for the sake of its easier manipulation and soldering than the galvanised wire. Taking any one cube at a time, each level therein was first made by bending and cutting the copper wire to fit the plan, and soldering on branch levels and crosscuts while held in position also on the plan. Then sections through any vertical and underlie shafts or desirable winzes were plotted on the sectional paper and wires cut and bent to the sections, notches being filed in the underlies for the reception of the levels in their correct position. The shafts were held at the correct angle in a vise or by other means while the levels were being soldered to them and connected by the winzes, the correct relative orientation of the levels and underlies being first assured by inspection with the plan. As the insertion of the numerous winzes and rises was of no advantage, and added very greatly to the labour of construction, only those winzes were represented which were of use in demonstrating some feature or were of advantage in stiffening the model. The wires representing the shafts, levels, etc., having thus been soldered together, these were suspended in the wire cubes by means of fine wire attached by solder to the edges of the cubes and acting as ordinates therefrom, being attached also to the wires representing the workings wherever those passed from one unit cube to the next. Occasionally an insufficiently supported end, which did not reach to the cube surface, had to be supported by fine wire stretched diagonally across the cube, the correct position being determined by measurement before the fine wire was soldered on to the cube. After the workings were thus reconstructed the model was painted various colours according as to whether the workings were in country rock, dyke rock, unpayable lode or payable ore, the wire cube frame being blackened so as not to conflict with the workings. The completed model contained thirty-five of the unit cubes, and was, of course, capable of further extension in any direction should that at any time be desired. It showed the relative positions of workings and ore shoots on four distinct lodes, and was of great advantage in the consideration of the deep-sinking proposition, besides showing where further prospecting work was desirable in the higher levels.

The author found the model very instructive in deciding certain geological relations which had been subject to doubt.

STATE AID TO MINING IN OTHER MINING COUNTRIES.

Government Recognition of the Fact that Mining is Fundamental to National Prosperity.

[BY RUSSELL D. GEORGE.]*

LET us take a glimpse at what is being done to aid and encourage mining in other countries. Australia has developed her agriculture and her manufacturing. She has spent millions for irrigation, but the following sketch will show that neither the federal nor the state government has lost sight of the fact that mining is fundamental to the prosperity of the commonwealth and the individual states. West Australia.—In 1902 the Mining Development Act was passed providing funds "to subsidize and enable companies or miners to further develop gold or other mines, and for other purposes." It provides for: (a) Advances for pioneer mining; (b) advances for prospecting; (c) establishment of plants for crushing, ore dressing, cyaniding or smelting; (d) assistance for boarding. The Minister of Mines may aid or advance money to: drain any mining area; assist mining by sinking or crosscutting; sink shafts for purposes of prospecting at great depths below the surface, where large expenditures are necessary; provide means of transport for miners or prospectors to any unproved mineral country. Applications for aid are submitted to the State geologist or State mining engineer. If a loan is approved, the borrower pays 5 per cent. per annum. The limit to one borrower is $5,000. The scope of this law was somewhat narrowed in 1906, so as to apply mainly to the purchase of approved machinery and to loans where the general public interest would be served as for example, in the exploration and development of new mining territory. The production of mica of commercial quality is subsidized, and liberal rewards are offered for the discovery of gold, metallic minerals, coal and precious stones. Tasmania.—"Reward claims" are given at peppercorn rentals for the discovery of promising mineral deposits in essentially new districts. Money rewards up to $500 are also made for discoveries in districts never before mined or where mining has practically ceased. In recommending the organisation of government prospecting parties, the Secretary for Mines says: "The mining industry is the most important of our industries and therefore needs fostering and encouraging in every possible way. With vast areas of unexplored mineral country I feel that there is a great future before us, and that the industry is still in its infancy, and the more we can do to promote its welfare by encouraging and assisting prospectors to go out in search of minerals, the better. What matters the expenditure of a few pounds now, if there is no immediate return? The establishment of one payable field will ultimately repay a thousandfold any expense the department may incur in sending two or three prospecting parties into the field." In accord with this, the State appropriated $5,000 to assist prospectors to further develop their discoveries. Away back in 1889 an act was passed to encourage deep sinking, where the companies had reached a depth of 500 feet or over. The money advanced becomes a first charge against the profits, according to a sliding scale. The amount of loan granted varies from £1 for each £1 spent on shafts not less than 500 feet deep, and 10 shillings for every pound spent for shaft sinking, drainage, etc., at depths of 500 feet and over. New South Wales.—The State grants aid in many ways, but one significant feature is the aid of prospectors. For many years the sum of $75,000 annually has been placed at the disposal of a board whose chairman

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*From *Mining Science*.

is the State geologist, "to promote prospecting for gold and other minerals, and to encourage the opening of new fields." The board examines carefully, taking expert advice, all applications for aid, and satisfies itself as to their worth. The advance does not exceed 50 per cent. of the estimated cost of the undertaking. The total sum so expended has exceeded $2,000,000. The State has built crushing plants and has loaned prospectors money to build their own plants in places remote from those of the State. Full examination into the merits of each case is made by competent officials. The advance must not exceed 75 per cent. of the cost of the plant. The prospector may contribute his 25 per cent. in the form of labour. No interest is charged, but the plant must be available for public service a certain number of days each year. Queensland.—Aid is granted in four principal ways: (1) Assistance to prospecting. (2) Grants for roads and bridges providing access to mineral fields. (3) Loans in aid of deep sinking. (4) For mining machinery. Applications for aid are carefully examined, and passed upon only after thorough investigation by competent agents of the Government. The aid may be granted directly by the Minister of Mines, or to a local authority, or the warden of the district or to miners' associations. The loan is not limited by law, but it is provided that, for the purchase of machinery, the borrower must have spent £1 for every £1 loaned to him. The plant becomes the Government's security, but there is no recourse against the borrower personally. Victoria.—Victoria seems to have been the pioneer in this form of legislation for the development of mining. In the mining development act, provision is made for: (1) Advances for development of mining. (2) Construction of roads and tracks for mining development. (3) Establishment of treating plants. (4) Construction of plants for sluicing for gold. (5) For prospecting and for disseminating information and instruction as to the mining resources of Victoria in Great Britain and other countries. Appropriations for such advances average $195,000 annually. The primary aim is to aid in original work, such as prospecting, development of prospects and of all forms of pioneer mining. The loan must be approved after most rigid investigation, and is subject to interest at 2½ per cent. before any dividend is paid from the development of the property. It also becomes a first mortgage on the property. The borrower must also prove that he spends of his own funds a sum equal to the loan.

Drainage, deep exploratory boring or sinking, the development of coal mining, metal mining other than for gold, are proper objects for State aid. The State has purchased cyanide plants, boring machinery and special equipment for the school of mines, looking toward such aid to mining development. Diamond drills are leased by the Government.

South Australia.—In South Australia the loan becomes a debt due the State, and repayment is made by turning over to the State 50 per cent. of the net profits until the obligation is discharged. The State maintains a crushing plant, and owns and leases diamond drill outfits.

New Zealand.—The regulations to aid for mining development are essentially the same as those of New South Wales, and other Australian States. Very liberal rewards are offered for the discovery of new mineral deposits. Money is appropriated to assist prospectors, both in exploring new territory and developing claims. In 1912, $230,000 was spent in this work. The Government loans diamond drilling outfits, and has undertaken the driving of a tunnel for drainage and deep prospecting in the Thames gold field.

THE YEAR WITH THE ROBINSON.

Financial Position Explained—Question of Ore Reserves—Recoverable Tonnage, 1,007,600 Tons.

During 1913 the Robinson working profit amounted to £724,792 7s. 5d., from which has been deducted the difference between sundry expenditure and revenue for the year, amounting to £26,706 11s. 4d., making a net profit for the year of £698,085 16s. 1d., which has been carried to Appropriation Account, and with the balance unappropriated at the commencement of the year, £348,996 18s. 1d., and £1,475 16s. 11d. in respect of forfeited dividends—a total of £1,048,558 11s. 1d.—has been dealt with as follows:—Expended on capital account—equipment, £950; annuity paid to Government in respect of undermining rights, £46,576; Government tax on profits, £64,955; dividends Nos. 42 and 43, £412,500; total, £524,982; leaving a balance unappropriated represented by cash and cash assets, less liabilities, of £523,576. The directors' report adds:—"In accordance with the circular of 7th February last, the directors have notified the company of their intention to resign office, such resignation to take effect at the annual general meeting. This step has been taken owing to the form which the opposition to the proposed amalgamation with the Crown Mines, Limited, took, and in order to test whether the want of confidence in their management shown thereby is endorsed by any considerable portion of the company's shareholders. The directors have declared themselves prepared to accept re-election should shareholders so desire. As intimated in the notice convening the annual meeting, Mr. Robellaz has already resigned. No decision has yet been arrived at with regard to the freeholder's interest in undermining rights under Bewaarplaatsen." In the course of his report, the acting consulting engineer, Mr. Palmer Carter, writes:—

The results for the latter half of the year were adversely affected by the shortage of native labour, consequent on the miners' strike in July. A comparison of the more important features of the year's work, as compared with the previous year, is as under:—1913: Tons mined, 700,149; tons from surface dump, 26,734; per cent. sorted, 8·1; tons milled, 663,900; yield per ton. 35s. 9d.; cost per ton, 14s. 1d; working profit from current treatment, £724,792; profit from accumulations, £5,378; total working profit, £730,170; percentage of Main Reef mined, 38. 1912: Tons mined, 673,058; tons from surface dump, nil; per cent. sorted, 13·8; tons milled, 577,300; yield per ton, 43s. 8d.; cost per ton, 15s. 8d.; working profit from current treatment, £803,761; profit from accumulations, £8,515; total working profit, £817,276; percentage of Main Reef mined, 25. Owing to the gradual reduction in the number of stope faces capable of supplying large quantities of the higher grade ore, the increased tonnage was made up from development ore from surface dumps, and Main Reef. This resulted in a fall in yield of 7s. 11d. per ton milled, and a decrease in working costs of 1s. 7d., with a reduction in working profit of £83,969. A small amount of development work was carried out on the lowest levels, disclosing good values in each reef. The development of the mine is now practically completed. The ore reserves have been re-estimated as at 31st December, 1913, and now amount to the following: Leader, 349,300 tons, going 10·2 dwts. or 42s. 10d. over 82 inches; South Reef, 189,200 tons, going 11·1 dwts. or 46s. 7d. over 65 inches; total Leader and South Reef in block ground, 538,500 tons, going 10·5 dwts. or 44s. 1d.; estimated tonnage as recoverable from old workings, stope and shaft pillars and packs on these reefs, 469,100 tons; total, 1,007,600 tons. Compared with the previous year, there is a large increase in the tonnage estimated as recoverable from old workings. This is due to a readjustment to the dyke below the 13th level of the line bounding the area including old workings. In addition to the above, the re-estimate of available Main Reef gives a tonnage of 772,900 tons of payable ore at 4·3 dwts. (18s. 1d.) per ton, of which 130,100 tons are in the form of packs of broken ore, used as temporary supports in the workings. Sandfilling was discontinued in July, but resumed during September, when severe caving was felt in the lower levels at No. 2 shaft. During the last months of the year sufficient sand was filled into the workings to considerably improve conditions on these levels, and they will be strengthened further by an arrangement which has been made to run sand into the stoped-out areas of the Robinson Deep, immediately adjoining this company's boundary. The machinery and plant were maintained in good working condition, and no capital expenditure was required on their account during the year. No further capital expenditure is at present contemplated.

Mr. Paul Selby, the acting manager, writes, *inter alia*, as follows:—

The footage for the year, viz., 3,025 feet, was 2,798 feet less than that accomplished during 1912. The development of the mine can now be regarded as practically completed. A small footage will still be necessary in order to fully expose the reef in some of the awkward corners. The percentage of Main Reef mined for the year, 38 per cent., is the highest on record for this mine, and is 13 per cent. higher than for 1912 and 1 per cent. greater than for 1910, the previous best year. The total quantity of sand lowered into the mine during the year was 134,310 tons, making the grand total to date of 542,428 tons; the largest quantity in any one month was during December, 1913, when 55,580 tons were lowered, and the largest quantity filled in any one day being 10,350 tons.

May Consolidated.

The May Consolidated milled 29,560 tons during the quarter ended 31st March, and the value of the gold recovered came to £24,413 13s. 1d., or 16s. 6d. per ton milled. Working costs were £24,212 1s. 9d., or 16s. 4d. per ton, so that the working profit was £202.

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THE YEAR WITH THE ALBU GROUP.

A Review of the Results Secured by Subsidiaries in 1913—How the Mines have Fared Since the end of the Year.

Reports of the various subsidiaries of the General Mining and Finance Corporation for the year 1913, have now been issued and they disclose the fact that the mines under Albu control, have fared very similarly to the other propositions operating on the Witwatersrand during the twelve months recently brought to a close. That is to say they have passed through a troublous and difficult period, and whilst in the case of some concerns results have been very good, and in the case of others disappointing, it must be conceded that the mines of which Sir George Albu is the head, have weathered the storms of strikes and labour shortage very satisfactorily.

The Van Ryn and Meyer and Charlton are the principal profit-earning companies of this group, but the former is a company with head offices in London and will not be considered in this article dealing with the affairs of the Johannesburg-controlled concerns.

MEYER AND CHARLTON.

The Meyer and Charlton report, as usual, discloses a very strong position. After paying dividends totalling 60 per cent. and bonus of 10 per cent.. absorrbing £140,000, etc., a balance of £117,919 is carried forward. The financial position shows an excess of liquid assets over liabilities of £117,633. The total dividends and bonuses paid by the company, aggregating £1,295,308 19s., amount to 1,175 per cent. on the capital issued from time to time. The full mill of 75 stamps, with accessory tube mills, crushed 173,123 tons of ore, yielding gold to the value of £409,313 (47s. 3d. per ton), working expenditure amounting to £158,388 (18s. 3d. per ton), leaving a profit on mining of £250,925 (28s. 11d. per ton), leaving recovery shows an increase of 4s. 9.23d. per ton, and the working costs a reduction of 9.82d. per ton, as compared with the results of the previous year. The payable ore reserves are estimated by the Manager at 434,096 milling tons, of an average value of 12.65 dwts., being an increase of 92,361 tons and 0.65 dwt. on the estimated reserves at the end of 1912. These reserves have been paid out of past profits. A statement of revenue and expenditure from the formation of the Company to December 31 last shows that the revenue from 2,305,824 tons of ore milled, and from other sources, amounting to £4,479,783, or 38s. 10d. per ton, from which a net profit, including the premiums on new share issues of £2,102,345 has been derived. The gross profit for the year shows an increase of £63,403 over that for the preceding year, and constitutes a further record for the company. These particulars may be supplemented by data culled from the report for the quarter ending March 31st, 1914, which has just been issued. For the three months the profit was £65,590. The average assay value of payable ore developed during the quarter was 26.26 dwts. per ton, computed over a stoping width. In consequence of the strike in January the working profit for the quarter is £2,973, 5s. 1d. less than for the preceding quarter. The Main Incline Shaft has been sunk 87 feet and is now 77 feet below the 21st Level. A new sample crusher house has been erected, and fitted with special dust-allaying appliances which are proving very satisfactory.

WEST RAND CONSOLIDATED.

At this mine the gross profit for the year was £109,208 which added to the balance brought forward, gives a total credit of £217,077. From this debenture interest and other outgoings have been paid, leaving a balance of unappropriated profit of £174,247 carried forward. The mill of 100 stamps, with tube mills, crushed 321,050 tons, yielding gold to the value of £456,271 (28s. 5d. per ton); working expenditure totalled £365,052 (22s. 8d. per ton), leaving a profit from mining operations of £91,219. Payable ore reserves are estimated at 1,364,956 mining tons averaging 6.16 dwts. over 50.8 ins. To this may be added a further 213,360 tons of payable rock, the final valuation of which is not yet available. In addition, there are 462,925 tons of ore partially developed for a large proportion of which an average mine grade is indicated. In view of the paramount importance of reaching the stage justifying the doubling of the present capacity of the reduction works, development operations were carried on, in spite of labour shortage, as nearly as possible on the large scale previously laid down, resulting in augmented footage both in shaft sinking and development, and the increase of the fully developed payable ore reserves by 341,000 tons and of 256,750 tons in the partially developed "probably payable" ore. The working profit for the three months ended March 31st, 1914, shows a decrease of £6,136 11s. 7d., as compared with the results obtained for the previous quarter. This reduction is almost wholly attributable to the general strike which occurred in January, and which affected this property more seriously than most of the other mines along the Reef. The shortage of native labour referred to in the preceding Quarterly Report was also experienced during the larger portion of the period covered by this Report, but in March the position considerably improved, and that improvement has been fully maintained since.

NEW GOCH.

The Directors, in their report for the year ended December 31, 1913, state that on January 22, 1913, £23,975 debentures were drawn for repayment at £108 per cent., and became payable on July 1 following. There remain £137,550 5 per cent. debentures. In January last further £25,075 debentures were drawn for redemption at £108 per cent., payable on July 1, 1914. The profit from mining operations for the year was £62,903, and, with the addition of sundry revenue, amounting to £1,586, the gross profit totalled £64,489. This, added to the credit balance of £28,053, brought forward, gives a total credit of £92,542. A balance, being unappropriated profit, of £47,181, is carried forward. The mill of 120 stamps crushed 327,600 tons, yielding gold to the value of £328,834 (20s. per ton); working costs totalled £265,931 (16s. 2d. per ton), leaving a gross profit from mining operations of £62,903 (3s. 10d. per ton). The ore reserves have been re-calculated as at the end of the past financial year, and are estimated by the Manager at 841,479 tons of fully developed payable ore, of an average mine value of 5.21 dwts. over 96 in., and 75,609 tons of payable ore, partially developed of an average value of 4.52 dwts. over 87 ins. In all the reserves total 917,088 tons, averaging 5.16 dwts. over 95 ins., or a decrease of 40,500 tons in quantity, but an increase of 0.07 dwt. per ton in value when compared with the position at the end of the preceding year. The results for the period under review, although showing an increased profit, were adversely affected by the general strike in July last, which disorganised the work during the month and also (owing to the feeling of uncertainty and unrest which prevailed) for the subsequent months of the year. In view of the more settled conditions now obtaining it is hoped that the returns for the next financial year will show a satisfactory improvement. Since the conclusion of last year this Company has, as was remarked in our last issue, been doing much better, and it is most gratifying to note from the report for the quarter ended March 31st last that the working profit shows an increase of £6,102 7s. 10d., as compared with that for the previous quarter, notwithstanding the fact that the returns for January were unfavourably affected by the general strike which occurred during that month. The improved results are due to a general advance in mine values.

ROODEPOORT UNITED MAIN REEF.

The report for 1913 shows a gross profit of £14,420, which with the balance brought forward from the previous year gives a total of £154,647 to the credit of appropriation account. The financial position shows an excess of liquid assets over current liabilities of £9,963, but a liability of £259,250 to the General Mining and Finance Corporation for advances. Working costs amounted to £273,813 (18s. per ton) leaving a gross profit from mining operations of £11,793. Payable ore reserves are estimated by the Manager at 370,732 tons. The average grade of the ore milled was the lowest in the history of the Company, and is to some extent attributed to the inclusion of 124,809 mining tons of ore reclaimed from old workings, which, although of low grade, can be mined at a comparatively low cost, and which it is desirable to recover before the possible caving in of the ground at a later period. Two additional adverse factors were the overwind at the Kimberley shaft at the end of January, 1913, and the miners' strike in July. The fully developed payable ore reserves have been maintained at practically the same tonnage as at the end of the previous year, but the average value is 0.22 dwt. per ton better. In the quarter ended with March 31, 1914, the working profit was under one half-penny per ton milled, or £130 7s. in the aggregate. It is explained that this narrow margin is due to the exceptionally low grade of the ore milled during the quarter, which included a large proportion of rock reclaimed from old workings. This reclamation rock, although of low average value, has hitherto been regarded by the management as allowing a profitable treatment, but in view of the recent results it has now been decided to reduce the quantity of this class of ore for the mill.

Aurora West.

The Profit and Loss Account of this Company shows that the total revenue for the year amounted to £227,762 19s., and the working expenditure to £170,804 0s. 9d., leaving a gross profit of £56,958 18s. 3d. As the actual proceeds of the net profits for 1912 and 1913 (£28,711 16s. 3d. and £40,426 7s. 2d. respectively—together £69,138 3s. 5d.) were utilised in the reduction of the Company's indebtedness, and are therefore not available for distribution, there is no object in showing a credit in the balance-sheet in respect of these profits. They have accordingly been appropriated to writing down the respective items under the heading of Mine Equipment and Development in the following proportions:—Permanent works, £11,425 10s. 6d.; machinery and plant, £29,497 7s.; buildings, £6,135 10s. 8d.; mine development, £22,079 15s. 3d. £69,138 3s. 5d. During the year the full mill of 80 stamps ran for 337.46 days, and crushed 170,661 tons of ore, yielding gold, etc., to the value of £226,522 10s. 1d., or 26s. 6.553d. per ton. The working expenditure amounted to £170,804 0s. 9d., equal to 20s. 0.197 per ton milled, leaving a profit on mining operations of £55,718 9s. 4d., or 6s. 6.356d. per ton. As compared with the previous year, the working costs show a slight increase of 3.678d. per ton crushed, but, on the other hand, the yield is 1s. 9.402d. per ton higher, and the working profits in consequence reflect an increase of £14,641 4s. 2d. The manager estimates the fully developed payable ore at 443,927 milling tons, of an average of 6.87 dwts. per ton. In addition there are in suspense, partially exposed but not immediately available for stoping, 105,864 milling tons of an estimated value of 5.56 dwts. The fully developed ore reserves show a diminution of approximately 22,000 milling tons, as compared with the reserves at the close of the previous year, but on the other hand there is an increase in the average value of .80 of a dwt.; this is due to the fact (as explained in the manager's report, appended hereto) that the minimum limit of payable ore has been placed at a higher figure, with the result that certain blocks have been cut out of the ore reserves, but with the effect also of thereby raising the general average value of the reserves as a whole. Notwithstanding the interruption of mining operations by reason of the General Strike, which occurred in the early part of July last, and which, in consequence of the resulting decrease in the native labour force, prejudicially affected the working of the property during the remainder of the year, the returns for the period under review show a very material and satisfactory improvement on previous results. The working profits have considerably increased, and the liability of the Company to the General Mining and Finance Corporation, Limited, was reduced during the year by £42,377. In the March quarter of this year the Company earned a profit of £1,582, and it is officially stated the working profit shows a decrease of £7,205 18s. 1d., as compared with the previous quarter, this being due principally to a shortfall of native labour during the period covered by this report, and also to the General Strike in January. On the 31st March the headgear was damaged as the result of an accident in the shaft. Hoisting operations were consequently suspended for 13 days in April whilst the necessary repairs were being effected, and the output for the latter month will therefore be prejudically affected.

Cinderella Consolidated.

Owing to the suspension of milling operations in June last, the profit and loss account for the past year has been divided into two periods, the first, from 1st January to 30th June, dealing with the portion of the year in which the gold production was proceeding, and the second, from the 1st July to 31st December, representing the later period during which only development work was in operation. The account for the first (i.e., producing) period shows that the total revenue for the six months amounted to £136,543 2s. 6d., and the working expenditure of £133,608 19s. 10d., leaving a gross profit of £2,934 2s. 8d., which has been transferred to the credit of the profit and loss account for the second (i.e., non-producing) period covering the half-year from 1st July to 31st December. This latter account shows that after adding sundry revenue amounting to £3,530 19s. 8d., and debiting general mine expenses and head office expenditure for the six months in question, the working loss for the year under review was £5,581 13s. 4d. The fully developed payable ore reserves are estimated at 613,000 tons of an average assay value of 6.35 dwts. per ton over a stoping width of 48 inches. There are also 24,000 tons of partially developed payable ore of an estimated average value of 7.36 dwts. over a width of 65 inches. In addition to the above there are blocks (partially developed) estimated to contain approximately 207,000 tons of ore, which have been placed to suspense as the necessary data for valuation purposes are not available. From the Technical Adviser's report it will be seen that at the time of shutting down the mine the Central Shaft had been sunk to a vertical depth of 3,070 feet, or within approximately 350 feet of the point at which the reef horizon is estimated to be intersected, and that the 5th Level East (Connection Drive) had reached a total length of 4,195 feet from the Main incline, or approximately 1,000 feet from the point of connection with the projected Incline from the Central Shaft.

New Steyn Estate.

The report of the directors for 1913 states that the revenue collected during the year on account of the company's half share of the licences from companies and syndicates owning claims on the freeholds of the farms Vlakfontein and Doornkop was £3,361. The revenue for the year from interest, licences, and rent was £5,016, and the expenditure, including cost of administration, claim licences and taxes, £8,841, leaving a net loss of £3,825, which, deducted from the unappropriated profit brought forward from the previous year of £62,085 leaves a credit balance of £58,260 to be carried forward. The reserve account of £54,473, formed from premiums received from the issue of shares, is unchanged. The financial position shows an excess of liquid assets over liabilities of £81,061.

Rand Collieries.

The report for 1913 states that the expenditure on mine equipment, shaft sinking, development, etc., was £20,497. Revenue from rents, etc., amounted to £867, whilst on the other hand interest on advances amounted to £11,305. The financial position shows an excess of liquid assets over current liabilities of £6,688. There is a liability of £175,552 to the General Mining and Finance Corporation in respect of advances made. Shareholders were advised in the report for the quarter ended September 30, 1913, that, in view of the financial position of the company and the impossibility under the then existing conditions of obtaining the additional working capital required to adequately develop the property, the mine had been closed down until a more favourable opportunity should present itself for re-financing the company. Since that date, the mine has remained in the hands of a caretaker, and expenditure has been confined to the payment of mynpacht dues and such other outlays as are necessary for maintaining the property. The ore exposed by work done varied considerably, both in width and value, but the general value was low.

WHAT IS WRONG WITH RAND MINING?

American Advice on Labour Efficiency—Cryptic Suggestion to "Train Some Black Men and Use More White Men."

The *Mining and Scientific Press*, of San Francisco, has the following in its issue to hand by this mail:—

South Africans have been much disturbed at the decrease in the gold yield of the Rand, and are holding many a solemn inquest. The *South African Mining Journal* has been running a series of articles on "What is Wrong with South African Mining?" In the issue of February 21 it is urged that the Government should offer more liberal terms on leases so as to induce the opening of more mines. At this distance it would seem to us a poor policy to open more mines when stamps are hung up and plants are already idle because of lack of labour, and when one, at least, of the difficulties is that capital has been too easily obtained in the past. All mining districts, even the largest, come to a time when decreasing grade of ore requires lower operating costs. The easy way to meet the situation is to increase the plant and distribute fixed charges over a larger tonnage, at the same time that by shortening the life of the property the total sum spent in annual salaries is decreased. It requires, however, nice judgment to do this without disaster. The need ordinarily arises when the mine or district is doing well and when it is easy to obtain money. If the new money be charged to capital account, satisfactory operating costs are obtained and these last long enough, in many cases, to allow those chiefly concerned to sell their holdings, but not much longer. Such at least has been the history of many a good mine. The production of metal, however, must go on regardless of changes in stock ownership, and the engineer on the ground has then the very practical problem to face of how to reduce the real costs. It is this situation that the Rand engineers must face. They have further a peculiar difficulty in that the enormous scale of operations, in proportion to the population, calls for a labour supply that simply does not exist; taking into account racial prejudices that, rightly or wrongly, forbid opening the field freely to the labour market of the world. The mines of the Rand must have more labour or more efficient labour. The former is, at present, out of the domain of practical politics; the latter points the way to long years of effort, and raises troublesome questions as to what would be the future relations of the white and black races in South Africa if the black men were trained and educated to real efficiency.

The American way of meeting the situation would be to train some black men and use more white men. We are by no means prepared to say that that plan would meet the situation in South Africa. Our race problem, even in the southern states, is no such problem as exists on the Rand, and we have by no means made such a success in solving our problems as to warrant preaching to others. At the same time, we may be permitted to point out that in proportion to the work accomplished in the past century, the United States has been chronically short of labour. Our captains of industry have had to develop machinery and relatively efficient workmen because men of any sort were scarce. Despite the large investment, immense scale of operations, and the use of "cheap" labour, Rand costs, while low, are not too low. Making allowance for the "phantom profits" of which Mr. T. A. Rickard has written effectively in *The Mining Magazine*, the cost is at least 20 shillings per ton. At the North Star mine in California, a gold-quartz vein is worked which in thickness, dip, and depth of workings resembles greatly the Rand bankets. The ore is mined, hoisted, crushed, and treated by amalgamation and cyanidation, as on the Rand. A trifle over 100,000 tons per year is handled, and the cost is just about 20 shillings. At the Empire mine near by, Mr. George W. Starr, who formerly operated on the Rand, manages a similar mine, and, while detailed figures are not made public, it is known that the cost is at least as low as at the North Star. This work is all done with white labour, working 8-hour shifts, under union conditions, for $3 per shift and above. Comparisons of cost made also with thin vein coal mining in various European countries, as well as with metal mines in general, raise grave questions as to whether the "cheap" labour of the Rand is really cheap. It is to be anticipated that the output of the Rand will decline in any event. To open more mines would be simply to rob the others of workmen. To increase the units of output from existing mines seems hardly possible save by the old-fashioned plan of increasing the input of labour, and an American may be permitted to "guess" that this will only be done by increasing the efficiency of the workmen in one way or another.

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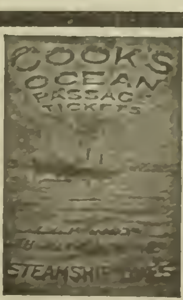

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THE FOUNDATIONS OF "THE COLOUR BAR."

No Such Thing as Racial Anatomy—The Case for the Other Man Who Does Not Happen to be a White Man—Why He is Coloured—His Ability to do Things—The Mental and Physical Sameness of the Race.

THE question of white exclusiveness throughout the world in some aspects is discussed by Dr. A. Caldecott in the *London Quarterly*.

ARE WE ONE RACE?

"Is there, in fact, a single Human Race? or is Humanity, in truth, only a name for a group of different races?" asks Dr. Caldecott. "Man never knew so much about himself as he does to-day. Both on the physical side and on the mental, physiology and psychology have advanced by improvements in their methods no less than by vast enrichments of their material, and the comparatively new sciences of anthropology, ethnology, and sociology have taken their place as studies of university rank. It is for us to ask what is their answer to our present question.

IMPORTANCE OF DIFFERENCES.

"We should note, at the outset, that there is much in the trend of modern science that tells in favour of the great importance of differences. The progress of organic life generally is effected by the accumulation of differences: varieties and species go branching out, becoming more and more separated; the process of creative evolution is, in Bergson's term, by way of canalizations, settling into diverse channels or streams of change. Within the human race, even if we may assume singleness of origin, the appearance of differentiations both in body and in mind is on a par with the process of physical and mental development generally.

ALL ONE BODY WE.

"Let us begin with physiology. Here the evidence is clear; there is no such thing as 'racial anatomy' in the sense of a different anatomy for each of the races of mankind. 'After prolonged and highly specialised research,' to use the words of Dr. Kohlbrugge, of Utrecht, it has not been found that there are any substantial differences in the fundamental structures or functions of the body between European and other races, either in the elementary structures concerned with, *e.g.*, breathing or digestion, or in the higher structures concerned with consciousness. It is found by medical science that all races react to drugs in approximately the same manner, and are susceptible, within minor variations, to the same principal diseases.

COLOUR THE MARK.

"The outstanding mark of differentiation is that of 'Colour,' and it is this that plays so prominent a part in the popular valuation, leading to unfounded inferences as to deeper differences, and giving rise to antipathies which are out of proportion to causes which science can discover. There is no doubt that difference of skin colour is one of the greatest racial barriers; and yet colour does not penetrate to the innermost or true skin; it is not fully even skin deep.

"It is a matter of 'climatic control,' writes Mr. Lyde, Professor of Economic Geography in the University of London; and he proceeds to specify how climatic control works through the related activities of the lungs, the intestines, and the skin, the tropical climate throwing upon the skin and the intestines work that is done in temperate climates by the lungs, and the skin becomes dark in consequence. In short, man is 'pigmented against too much sunlight.'

"For mental differences we turn to the anthropologists and the psychologists. Let use hear an authority in both their sciences, Dr. C. S. Myers, a first-hand observer in the Malayan Islands and in the Sudan, and now in charge of experimental psychology at Cambridge. He laid before the Universal Races Congress (London, 1911) these two propositions: 'The mental characters of the majority of the peasant class throughout Europe are essentially the same as those of primitive communities.' 'Such differences between them as exist are the result of differences in environment and in individual variability.'

ALL ALIKE.

"The first proposition protests against separating off a European race, and the second assigns variation to the individuals without admitting a different variation due to race. Dr. Myers, in the same paper, is specific as to some important mental functions: 'We conclude, then, that no fundamental differences in powers of sensory acuity, nor, indeed, in sensory discrimination, exist between primitive and civilised communities. Further, there is no proof of any differences in memory between them. . . . In temperament we meet with just the same variations in primitive as in civilised communities.' This is surprising, perhaps, but Dr. Myers proceeds to concrete statement: 'In every primitive society is to be found the flighty, the staid, the energetic, the indolent, the cheerful, the morose, the even-, the hot-tempered, the unthinking, the philosophical individual.' And still more surprising: 'It is a manifest error to suppose that primitive man is distinguished from the civilised peasant in that he is freer and his conduct is less under control . . . . if desired, I could bring before you many instances of self-control which would put to shame the members even of our most civilised communities.' A similar testimony was placed before the Royal Institution in January of this year by Dr. McDougall, a fellow-investigator with Dr. Myers in the Pacific, and now Reader in psychology at Oxford, from a study of the natives of Borneo.

THEIR MENTAL ABILITY.

"From America Dr. Woodworth, Professor of Psychology in Columbia University, writes: 'One thing the psychologist can assert with no fear of error. Starting from the various mental processes which are recognised in text-books (of psychology), he can assert that each of these processes is within the capabilities of every group of mankind. All have the same senses, the same instincts and emotions. All can remember the past, and imagine objects not present to sense. All discriminate, compare, reason, and invent.' (*Science*, 1910.) In the higher range of mental capacity an interesting observation has been made by a prominent sociologist, Dr. Gustav Spiller. He has asked what success has attended the students at universities in Europe and America who have come from non-Caucasian races. These students have included Chinese, Japanese, Indians, Persians, Turks, Egyptians, Negroes, Maoris, and others; and he has been informed, after detailed inquiry, that members of all these races have completed their courses substantially as well as those of European race. And as the peoples enumerated compose together with the Europeans, perhaps nine-tenths of humanity, there is little room left for any race incapable of intellectual capacity and power of concentration in study of a university standard. (*Sociological Review*, October, 1912.)

UNITY OF THE HUMAN RACE.

"The testimonies adduced above are from authorities in the sciences which take the whole range of man's physical and mental life, on its ordinary levels, into view. If, then," concludes Dr. Caldecott, "we find that in their judgment the peoples of the world are, apart from education and the influences of higher civilised life, alike in sensory perception, in reasoning power, in instinct, in emotion, and even in self-control, what need we more when asking whether or not there is a singleness of human nature which relegates race distinctions to a subordinate level of influence, and exhibits all men everywhere as capable of receiving the same religion?"

Lapsed Claims in Pilgrims Rest District.

According to the last *Government Gazette* the following lapsed claims in this district are open for pegging:—Graskop No. 27, claims Nos. 1210, 1211 and 1212, pegged in name of Wanderers Syndicate; Graskop No. 27, ten claims pegged under licence No. 1969 in name of P. J. M. Munro; Geelhoutboom No. 220, two claims pegged under licence No. 2015 in the name of F. L. Sullivan; Waterval No. 48, four claims pegged under licence No. 2096 in the name of H. Oldewartel; Grootfontein No. 1327, fifty claims pegged under licence No. 2139 in the name of H. McDougall; Grootfontein No. 1327, fifty claims pegged under licence No. 2140, in the name of Charles E. Meintjes; Erasmus Hoop No. 1270, two claims pegged under licence No. 2216, in the name of John Carr; Geelhoutboom No. 220, on claim pegged under licence No. 2248, in the name of F. L. Sullivan; Maux No. 34, twenty-two claims Nos. 25,607 to 25,628, pegged in the name of W. C. Huggett; Doornhoek No. 1266, ten claims pegged under licence No. 2285, in the name of E. G. Albath; Berlyn No. 458, two claims pegged under licence No. 2335, in the name of H. Oldewurtel; Frankfort No. 456, twenty claims pegged under licence No. 2337, in the name of K. N. Lambert; Waterval No. 48, ten claims pegged under licence No. 2341, in the name of De V. G. Pritchard; Frankfort No. 456, ten claims pegged under licence No. 2347, in the name of E. L. Wright; Government ground, twelve claims pegged under licence No. 2352, in the name of H. H. Hough; Lisbon No. 9, two claims pegged under licence No. 2355 in the name of G. R. Bates; Frankfort No. 456, ten claims pegged under licence No. 2357, in the name of E. L. Wright.

Blaauwbosch Diamonds.

Washing returns for April, 1914:—Tailings washed, 10,153 loads; recovered, 1,234 carats. Blue ground washed, 509 loads; recovered, 101 carats. Washing blue ground was resumed on the 29th April.

RELATION OF GEOLOGY TO MINING.*—III.

A Review of the Debt Mining on the Rand and Elsewhere Owes to Geology.

[By F. H. HATCH.]

THE following is a continuation of the article of "Relation of Geology to Mining":—

Enough has been said to indicate the dependence of mining on geology; but that this dependence is not universally admitted is evidenced by the prejudice against both the mining geologists and the scientifically trained engineer occasionally found among mining employers, by whom they are sometimes unfavourably compared with the so-called "practical miner." Rule of thumb methods, however, in either mine valuation or exploratory and development work can never command success; indeed, the unschooled miner often enough realises the value of geology and sets about acquiring such a working knowledge of its principles as will enable him to tackle the more prominent tectonic troubles met with in sinking or drifting. But men of this stamp are the exception rather than the rule, and it is clear that, *ceteris paribus*, the trained man, who brings to mining problems a sound knowledge of the principles underlying their engineering and geological aspects, not only starts with a pronounced advantage, but is enabled to assimilate practical details with far greater rapidity and certainty when once his mining career has commenced. Geology, however, is not the only science to suffer from the ignoramus and the bore. A more serious disability, perhaps, lies in the employment in mining work of the academic geologist who has had no previous experience of mines and is unacquainted with mining conditions and economics. The lavish natural indications, which at the surface attract the attention of the geologist, tend at first to elude him when he penetrates beneath it, since there the exposures are few in number, and, such as they are, small; moreover, they are, as a rule, covered with dust, begrimed with soot or buried in mud. Even to overcome initial difficulties, such as these, is not enough; to achieve a real success the work of the miner must be followed step by step, since in his progress he effaces the facts almost as soon as they are disclosed. It must be abundantly clear that mining geology is a branch of the profession distinct from pure geology, and that proficiency in this specialised department cannot be attained without a proper training underground. In the United States there is a growing tendency to differentiate the functions of the mining man; thus we find there an increasing use of the term "mining geologist" to designate a mining engineer strong on the geological side, or, what in practice amounts to the same thing, a geologist who has specialised in mining work. On the other hand, the term "mining engineer" is occasionally used rather in the restricted sense of a mechanical engineer who has specialised in mining machinery. It is clear that mining consists of two distinct parts: (1) The exploration and development of the ore body, and (2) the extraction and bringing to the surface of the ore: the first being essentially a problem in which geological principles are dominant, while in the second mechanical engineering plays the chief part. Since the expression "mining geologist" appears to have taken a definite niche in the edifice of mining engineering, it may be well to attempt a definition of his proper functions. In the province of metal mining, geology comprises the study of the ore deposit; its lithological environment, its enrichments and impoverishments and their causes, and finally the faults and dykes that traverse it and their effect. As a result of such investigations the mining geologist is enabled to trace the outcrop of the deposit; to trace and define the ore shoots; to predict, as definitely as the evidence will allow, their downward extension, to outline the scheme of development and method of mining best suited to their shape, size, dip, and pitch,† and having regard to any existing dyke or fault disturbance; to determine the amount and value of ore immediately or prospectively available; and from the nature of its mineral association to suggest the necessity, or otherwise, of eliminating the gangue by some form of ore-dressing or concentrating machinery, and, finally, to give a preliminary opinion, based on the mineral composition, as to the docility or refractoriness, as the case may be, of the ore in regard to metallurgical treatment. It is evident that the examination of a supposed mining field, or of a lode or ore body on which nothing but prospecting work has been done, is essentially the work of the mining geologist; and it may also be conceded that, provided he has served the requisite apprenticeship underground, understands the art of sampling, and can gauge with some approximation to accuracy the costs of mining and treatment, the inspection of a partially developed or "young" mine may also be properly entrusted to the mining geologist. In the case of a fully-developed mine, in which the whole, or practically the whole, of the available ore is blocked out for stoping, or at any rate is developed by drifts extending from end line to end line at the lowest levels permitted by the dip boundary of the property, the requirements are somewhat different. Here what is wanted is not so much the drawing of inferences from the geological environment of the ore, as a correct appraisement of the net profits obtainable by its extraction with due regard to the economic conditions prevailing. In this case, apart from the estimation of ore reserves, a consideration of the most suitable methods of extraction and treatment and questions of finance are of paramount importance. An actual apprenticeship in mine management, supplemented by a long experience of mine examination under the most varied conditions, are here the prime requisites for a successful valuation. Similar differences exist in regard to the management of mining properties. Prospecting and exploratory mining are essentially the work of the mining geologist. Even in the normal development of a mine, questions often arise that cannot be solved without the aid of a sound knowledge of tectonic geology. It is true that on small mines the mine manager is often expected to possess the knowledge of the mining geologist, the mechanical engineer, and the man of business. But big mines are, or should be, organised departmentally, and in that case are placed under the supreme control of a man chosen chiefly for his executive ability and power of organisation, irrespective of other attainments. The machinery is, of course, controlled by a mechanical engineer, the reduction works by a metallurgist, the supply of ore by an underground superintendent or mine foreman, while the exploratory and development work is best superintended by the mining geologist. Surveying and sampling are natural adjuncts of the mining geologist's department, and indeed the mine surveyor is often himself a competent geologist, recording on his plans the faults and dykes disclosed in the course of development, and determining the quantitative effect of the disturbance and the loss or gain of ore thereby caused. It must be evident, I think, that the point I wish to make is that the rôle of geology in mining is more important than is generally conceded, and that a recognition of this involves either an extended geological training for the mining engineer or a relegation of a portion of his functions to the mining geologist who has been trained in underground work. After all, whether a man is to be called a mining engineer or a mining geologist is of little moment; the important point is that the student who purposes to take up mining work as a profession should receive the best possible training for that end, and in this, I contend, geology must have a prominent place. The mining employer, for his part, should in all cases have a clear conception of what is essential for the proper development of his property, and should be able to choose a man whose special studies have fitted him for the particular work involved. If the mining employer requires guidance in this choice, that is the function of the consulting engineer.

(To be continued.)

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*Abstract of Presidential address delivered before the Institution of Mining and Metallurgy.

†Using "dip" for the inclination of the vein walls to the horizontal in a plane at right angles to the strike and "pitch" for the inclination of the boundaries of the ore-shoots (within the plane of the vein) to the strike of the vein.

Luipaardsvlei Estate.

The following is the result of operations for the month ended 30th April, 1914:—60 stamps ran 29·024 days, crushing 17,530 tons, yielding 1,842 ozs. fine gold; three tube mills ran 28·737 days, yielding 747 ozs. fine gold; sands treated, 12,440, yielding 1,428 ozs. fine gold; slimes treated, 5,090 tons, yielding 406 ozs. fine gold; profit from operations, £2,730; sundry revenue, £900; total profit, £3,630; working costs, 18s. 1d. per ton

Crown Diamonds.

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INCIDENCE OF THE INCOME AND LAND TAXES.

Official Statement Explaining Details of New Revenue Raising Proposals.

The Treasury has issued the following memorandum on the income tax and land tax proposals:

INCOME TAX.

It is proposed to levy income tax on incomes exceeding £1,000 arisen or accrued to any person or company wheresoever residing from any source whatever in the Union during the twelve months ended 30th June, 1914, and during the twelve months ended 30th June in each succeeding year. From each income liable to tax £1,000 will be deducted and the balance over and above the £1,000 deducted will be the taxable amount. On an income of £1,001 the taxable amount will be £1, on which sixpence will be charged. As the taxable amount increases the rate of tax per £ will rise by 1/2000 of a penny for each £1 of the taxable amount, so that on a taxable amount of (a) £2 the rate will be 6- 2/2000 pence for each £; (b) £3 the rate will be 6- 3/2000 pence for each £; (c) £4 the rate will be 6- 4/2000 pence for each £, and so on, so that on a taxable amount of £24,000 the rate will be 6- 24000/2000, or 1s. 6d. for each £. Where the taxable amount exceeds £24,000 a uniform rate of 1s. 6d. for each £ of the taxable amount will be charged. The rate of tax payable when the taxable amount does not exceed £24,000 may be calculated from the following formula: R=rate of tax per £; A=taxable amount, i.e., the taxable income less £1,000; $R=(6+A/2000)$ pence. Examples: (1) Say the income is £1,840, the taxable amount will be £840, on which tax will be payable at the rate of 6- 840/2000 pence for each £. This rate multiplied by 840 gives tax payable £22 9s. 5d.; (2) say the income is £10,450, the taxable amount will be £9,450, on which tax will be payable at the rate of 6- 9450/2000 or 10- 1450/2000 or 10- 1450/2000 pence for each £. This multiplied by 9.450 gives tax payable £422 5s. 11d. The rates of tax and the tax payable on various amounts will be as follows:—

Income.	Taxable amount.	Rate of tax per £ on taxable amount.		Tax payable.		
£	£	s.	d.	£	s.	d.
1,001	1	0	6	0	0	6
1,100	100	0	6 1/20	2	10	5
1,200	200	0	6 1/10	5	1	8
1,300	300	0	6 3/20	7	13	9
1,400	400	0	6 1/5	10	6	8
1,500	500	0	6¼	13	0	5
1,600	600	0	6 3/10	15	15	0
1,700	700	0	6 7/20	18	10	5
1,800	800	0	6 2/5	21	6	8
1,900	900	0	6 9/20	24	3	9
2,000	1,000	0	6½	27	1	8
2,500	1,500	0	6¾	42	3	9
3,000	2,000	0	7	58	6	8
4,000	3,000	0	7½	93	15	0
5,000	4,000	0	8	133	6	8
6,000	5,000	0	8½	177	1	8
7,000	6,000	0	9	225	0	0
8,000	7,000	0	9½	277	1	8
9,000	8,000	0	10	333	6	8
10,000	9,000	0	10½	393	15	0
11,000	10,000	0	11	458	6	8
12,000	11,000	0	11½	527	1	8
13,000	12,000	1	0	600	0	0
14,000	13,000	1	0½	677	1	8
15,000	14,000	1	1	758	6	8
16,000	15,000	1	1½	843	15	0
17,000	16,000	1	2	933	6	8
18,000	17,000	1	2½	1,027	1	8
19,000	18,000	1	3	1,125	0	0
20,000	19,000	1	3½	1,227	1	8
21,000	20,000	1	4	1,333	6	8
22,000	21,000	1	4½	1,443	15	0
23,000	22,000	1	5	1,558	6	8
24,000	23,000	1	5½	1,677	1	8
25,000	24,000	1	6	1,890	0	0
51,000	50,000	1	6	3,750	0	0
101,000	100,000	1	6	7,500	0	0

Provision will be made in the Act, to be passed before the proposals can be given effect to, for the exemption of certain incomes and for the deductions to be allowed from gross incomes in order to arrive at the amounts of taxable incomes.

LAND TAX.

The proposed tax is on the unimproved value of land outside the limits of jurisdiction of Municipalities and other urban local authorities. For the purposes of this tax unimproved value in relation to land will be taken to mean the sum which the land might be expected to realise if offered for sale on such reasonable terms and conditions of sale as a bona fide seller would require, assuming that the improvements (if any) thereon did not exist or had not been made. Every owner of such land exceeding 10,000 morgen in extent the unimproved value of which exceeds £10,000 will be liable to tax on so much of such value as exceeds £10,000. In the case of an owner of several estates or pieces of land the aggregates of the extents and values of these estates or pieces of land will be regarded as the extent and value of a single estate or piece of land for the purposes of the tax. The person or company owning land on the 30th June, 1914, will be regarded as the owner, and will be liable for any tax payable this year, and thereafter the owner on the 30th June, each year, will be liable for tax payable in each year. From the unimproved value of any land taxable each owner will be allowed a deduction of £10,000, and the balance over and above the £10,000 deducted will be the taxable value. On a taxable value of £1 the tax charged will be one penny. As the taxable value increases the rate of tax per £ will rise by 1/30000 of a penny for each £ of the taxable value, so that on a taxable value of (a) £100 the rate will be 1- 100/30000 pence for each £; (b) £200 the rate will be 1- 200/30000 pence for each £; (c) £300 the rate will be 1- 300/30000 pence for each £, and so on, so that on a taxable value of £90,000 the rate will be 1- 90000/30000, or 4 pence for each £. Where the taxable value exceeds £90,000 a uniform rate of 4d. for each £ of the taxable value will be charged. The rate of tax payable when the taxable value does not exceed £90,000 may be calculated from the following formula: R=rate of tax per £; V=taxable value, i.e., the unimproved value less £10,000; $R=(1\text{-}V/30000)$ pence. Examples: (1) Say the unimproved value is £18,500, the taxable value will be £8,500, on which tax will be payable at the rate of 1- 8500/30000 pence for each £. This multiplied by 8.500 gives tax payable £45 9s.; (2) Say the unimproved value is £55.000, the taxable value will be £45,000, on which tax will be payable at the rate of 1- 45000/30000, or 2½d. for each £. This multiplied by 45,000 gives tax payable £468 15s. The rates of tax and the tax payable on various amounts will be as follows:

Unimproved value.	Taxable value.	Rate of tax per £ of taxable value.	Amount of tax payable.		
£	£	d.	£	s.	d.
10,001	1	1	0	0	1
11,000	1,000	1 1/30	4	6	1
12,000	2,000	1 1/15	8	17	9
13,000	3,000	1 1/10	13	15	0
14,000	4,000	1 2/15	18	17	9
15,000	5,000	1 1/6	24	6	1
16,000	6,000	1 1/5	30	0	0
17,000	7,000	1 7/30	35	19	5
18,000	8,000	1 4/15	42	4	5
19,000	9,000	1 3/30	48	15	0
20,000	10,000	1⅓	55	11	1
25,000	15,000	1½	93	15	0
30,000	20,000	1⅔	137	7	9
40,000	30,000	2	250	0	0
55,000	45,000	2½	468	15	0
70,000	60,000	3	750	0	0
85,000	75,000	3½	1,093	15	0
100,000	90,000	4	1,500	0	0
210,000	200,000	4	3.333	6	8

Provision will be made to avoid double taxation in cases in which income taxable is derived from land subject to land tax.

New Device for Mines.

In the House of Assembly this week Dr. Macaulay (Denver) asked the Minister of Mines and Industries whether he had any information with regard to the Scout life-saving (roof detection) apparatus, and, if so, whether he would state whether the device was likely, in the opinion of the Mines Department officials, to prove of use in diminishing the regrettable number of accidents underground due to falls of roof. The Minister of Mines stated that attention has been drawn to the apparatus in question, and a specimen had been obtained for inspection by the Mines Department. The report upon this was to the effect that it would be of unquestionable use where the conditions were suitable. It was probable, however, that in many cases the increase of pressure and the fall of roof would be simultaneous. The instrument was rather delicate, and it was feared that it would be damaged by blasting. It was only by experience that its utility could be established, but it was certainly worth trying.

GRADE, COSTS, AND PROFITS IN MARCH.

Chamber of Mines' Analysis.

The following tabulation of the operations of the mines of the Transvaal contributing to the gold production is supplementary to the details published by the Chamber of Mines in its declaration on the 9th of the month:

THE WITWATERSRAND.

	Total value recovered. £	Value recovered per ton milled. s.	d.	Total working cost per ton milled. s.	d.	Total working costs. £	Working profit. £	Working profit per ton milled. s.	d.
1. Aurora West United ...	18,456	25	5	19	11	14,458	4,030	5	7
2. Bantjes Consolidated ...	28,855	23	3	20	7	25.592	2,947	2	5
3. Brakpan Mines	68,541	23	3	20	0	48,045	19,927	8	3
4. City Deep	80,881	38	0	23	2	48,644	30,316	14	5
5. City and Suburban	49,851	35	3	20	2	28,620	20,602	14	6
6. Cons. Langlaagte	56,146	24	5	14	10	33,736	21,882	9	7
7. Cons. Main Reef	31,442	30	5	20	9	21,483	9,616	9	3
8. Crown Mines	241,700	26	2	15	3	141,219	97,866	10	7
9. Durban Roodepoort ...	15,058	20	2	15	0	10,992	4,031	5	6
10. Durban Rood. Deep ...	31,892	26	5	24	8	28,884	2,481	2	1
11. East Rand Proprietary	210,131	29	3	21	4	146,303	51,960	7	7
12. Ferreira Deep	111,609	38	11	17	3	49,349	60,859	21	3
13. Geduld Proprietary ...	30,104	31	7	23	4	22,183	7,848	8	3
14. Geldenhuis Deep	66,367	27	6	23	3	55,833	9,552	4	0
15. Ginsberg	18,333	24	5	18	6	13,777	4,344	5	10
16. Glencairn Main Reef ...	15,785	14	1	11	10	12,577	2,379	2	3
17. Knight Central	24,790	23	3	19	5	20,457	4,006	3	9
18. Knights Deep	61,707	15	7	13	8	54,099	7,044	1	10
19. Langlaagte Estate	59,264	21	3	18	6	44,412	14,475	6	0
20. Luipaardsvlei Estate ...	19,786	21	9	17	11	16,346	3,201	3	6
21. Main Reef West	24,458	24	10	21	5	21,123	3,047	3	1
22. May Consolidated	8,534	17	1	16	3	8,119	393	0	9
23. Meyer and Charlton ...	34,458	45	8	16	2	12,100	22,264	29	9
24. Modderfontein B..........	64,221	35	5	15	3	27,206	36,309	20	4
25. New Goch	33,170	22	1	15	4	23,062	10,016	6	8
26. New Heriot	23,923	34	7	20	0	13,718	10.090	14	8
27. New Kleinfontein.........	69,068	26	7	17	3	44,811	23,506	9	0
28. New Modderfontein ...	95,960	37	6	15	7	39,860	55,142	21	6
29. New Primrose	27,360	21	10	12	1	14,956	12,002	9	9
30. New Rietfontein	6,788	22	10	21	0	6,259	528	1	10
31. New Unified	14,633	21	8	14	10	9,507	4,849	7	7
32. Nourse Mines	58,360	27	0	20	4	43,862	13,855	6	5
33. Princess Estate	30,588	25	0	23	7	28,289	2,211	1	10
34. Randfontein Central ..	246.589	23	5	16	8	172,666	71,004	6	10
35. Robinson	85,231	33	0	14	7	36 800	46,506	18	5
36. Robinson Deep	65,024	28	0	16	7	37,548	26,783	11	10
37. Roodepoort United	21,226	15	9	16	0	21,202	100	0	1
38. Rose Deep	86,441	25	4	16	2	55,079	30,425	8	11
39. Simmer and Jack.........	64,026	18	7	11	8	40,192	25,441	7	4
40. Simmer Deep	39,487	14	9	14	3	38,258	2,610	1	0
41. Spes Bona Tribute†......	4,668	16	8	—		—	—	—	
42. Van Ryn	51,211	26	4	15	6	30,238	20,901	10	9
43. Van Ryn Deep	64,757	33	0	17	11	35,137	29,618	15	1
44. Village Main Reef	60,131	36	3	18	6	30,170	28,224	17	4
45. Village Deep	70.504	27	1	17	2	44,616	25,079	9	8
46. Vogelstruis Estate.........	14,718	21	11	20	2	13,074	1,682	2	7
47. West Rand Central	3,768	32	9	27	6	3,167	599	5	2
48. West Rand Consolidated	30,490	25	3	20	11	25,129	5,450	4	6
49. Witwatersrand	50,403	24	3	13	3	27,406	22,937	11	0
50. Witwatersrand Deep ...	52,995	25	9	15	9	32,339	20,050	9	9
51. Wolhuter	42,634	25	0	16	6	28,156	14,022	8	3
Miscellaneous producers	7,246	—		—		—	—	—	
Witwatersrand totals	2793768	26	4	17	3	1801198	945009	9	1
†Private.				50 cos.		50 cos.	50 cos.	50 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered. £	Value recovered per ton milled. s.	d.	Total working cost per ton milled. s.	d.	Total working costs. £	Working profit. £	Working profit per ton milled. s.	d.
Heidelberg—									
1. Nigel	19,034	29	2	25	7	16,313	2,507	3	11
2. Sub Nigel	10,067	41	8	30	11	7,472	2,471	10	3
Barberton—									
3. Barrett	1,121	8	5	—		—	—	—	
4. Sheba	13,104	38	10	27	0	8,987	4,117	12	3
5. Worcester	3,938	15	2	12	1	3,150	766	2	11
Klerksdorp—									
6. Quest	3,160	15	3	11	9	3,429	734	3	
Lydenburg—									
7. Ceylon Lydenburg..... ...	1,066	34	3	27	4	849	209	6	9
8. Glynn's Lydenburg	7,960	41	4	18	9	3,579	4,296	22	6
9. Transvaal G.M. Estates	41,165	55	5	21	8	16,047	24,659	33	3
Miscellaneous producers	22,963	—		—		—	—	—	
Total (outside districts)	123,578	36	0	22	3	58,826	39,759	15	1
				8 cos.		8 cos.	8 cos.	8 cos.	
Grand totals	2917346	26	7	17	4	1860024	984768	9	2
				58 cos.		58 cos.	58 cos.	58 cos.	

RHODESIA GOLD MINING AND INVESTMENT COMPANY.

The Company's Valuable Interests Described—Position of Lonely Reef and Cam and Motor—A Good Profit.

The principal assets of this company are as follows:—Share interests: Lonely Reef, Cam and Motor, Sabi Gold. Mining interests: Bernheim Mines, Pretty Polly Mine, and Felixburg Claims. Detailed schedules of the share interests and claim holdings of the company are attached to the balance sheet. Full particulars of the work carried out on the properties are also given in the general manager's report. The development operations on Lonely Reef mine have been greatly hampered during the past year owing to the preliminary work necessary for sinking the new main incline shaft for the development of the mine below the 9th level. As a result the ore reserves at December 31 last show a slight reduction on the previous year's figures, amounting at that date to 172,557 tons of an average assay value of 17·14 dwts. The working results for the past year have been very satisfactory, 58,903 tons of ore having been crushed which have yielded 52,011 ozs. of fine gold realising £218,520 8s. 6d. The working expenses and royalty paid to B.S.A. Co. amounted to £92,128 1s. 8d., leaving a net profit of £126,392 6s. 10d., out of which dividends of 30 per cent. have been declared and paid. Cam and Motor trial crushings were started with the new plant on January 17 last, the first clean up being made at February 28 last. Bullion to the value of £16,643 was recovered from 10,693 tons crushed. The necessary alterations and adjustments required to bring the plant up to its full capacity have now been made, and the manager expresses the opinion that returns approximating the original estimates will now be obtained. Development work carried out by the company during the year has been mainly concentrated on the Bernheim group of mines. The ore reserves amount to about 26,000 tons of an assay value of 8¾ dwts. No development work has been carried out in the Sabi mine. The ore reserves remain as reported last year, viz., 49,000 tons of an average value of 10.36 dwts. This mine has been formed into a separate company (in which the company will hold approximately a 90 per cent. share interest). The directors are convinced that the present year will be one of increasing activity and expansion in Rhodesia, several companies having now completed the erection of large milling plants, some having already started operation and others commencing later in the year. The net realised profit is £6,953, which compares favourably with the profit of £4,201 earned during the preceding year. This has been added to the credit balance of £25,173 brought forward last year, making a total of £32,126 16s. 2d. to the credit of the profit and loss account.

THE APPLICATION OF EFFICIENCY METHODS TO MINING.

Some Valuable Points for Rand Mining Engineers—Question of Supplies and Labour—Importance of the "Time Study."

[By C. M. Leonard.]

Until a comparatively recent date, efficiency engineering was confined to industrial plants and construction work. The results obtained in these lines has suggested its application to mining and from the very nature of the necessary working conditions in mining, it would seem that even greater results might be looked for than in other industries. The cost of production in mining may be divided into two parts, viz.: Supplies and labour. Of these the latter is the larger. Supplies are usually considered practically a constant factor in the cost of production. They are, at least, less affected by a study of the details than labour. The importance of having excessive capital tied up in supplies is recognised, but it is doubtful if the interest on the amount necessary to carry an adequate stock of those in general use, would meet the loss due to the delays caused by continually running short of material. The amount of supplies which is necessary to carry is affected by the standardization of equipment. For instance, nearly every manufacturer of power drills is glad to have his machine given a trial. If this trial were made on ground which were fairly uniform, a careful record kept of the performance of each machine and a comparison made of the records, it would probably result in one machine of each type being selected as a standard and a basis established for the purchase of power drills. The adoption of one brand of steel usually insures more uniform results in the forge and consequently a better bit. Fuel, one of the principal items of supplies, is now purchased by most operators on an analysis basis, after determining the fuel best suited for each condition. One company has reduced the cost of their lubricating oil by using a commercial grade of a thick oil, adding other lubricants to meet various conditions. A study of explosives, their application and instructions in their use may result in a saving of a cent or two per pound in this item or a pound or two of explosive per foot of drift. The use of carbide lamps underground has demonstrated that they not only cost less but give a better light and are smokeless.

Labour.

During the past ten years it has been necessary for the mining industry to meet an increase of wages, varying from 8 to 21 per cent., a decrease of 20 per cent. in the working hours and in many instances a decrease in the price received for their product. The one object of labour is to receive larger wages and one of the main objects of the operator is to get lower costs. The question naturally presents itself, how can this condition be met to the satisfaction of both parties? There can be but one answer to this and that is by increasing the efficiency of labour. The conditions which have a direct bearing on the efficiency of labour are so varied, that an exhaustive treatment cannot be brought within the confines of one paper. Not only each district but each mine presents a different proposition in itself and a study of the details of the operating conditions is the only manner by which we may arrive at any definite solution. From our practical knowledge we may be able to sense a thing as being right or wrong. This judgment may err 5, 10 or 15 per cent. one way or the other and may represent the margin between a profit and loss, but from a set of figures compiled from a time study of the complete cycle of operations, from breaking the ore until it is loaded on surface, one is able to determine to what extent and at which point it is possible to make changes and the exact result of these changes. It enables the work to be so co-ordinated that each man is given an opportunity of doing a day's work and is not being held up by some other operation. It also provides an intelligent basis for making contracts and if the average man does not make the minimum wage, it is his fault rather than an error in judgment on the part of the foreman. A time study, to be of practical value, must be enough in detail and cover a sufficient period of time to enable one to get a fair average of the time required on each operation, and one which does not give this information is worse than useless, as it permits false conclusions to be drawn. To get positive results from this work it is absolutely essential that the co-operation of the entire executive force be maintained, and if there is any inclination on the part of a boss or foreman not to co-operate in the work, there remains but one of two courses to pursue, either discontinue the work along these lines or dispense with that person's services. No trouble should be experienced in getting the men interested in the work, for as soon as they realise that it means an increase in their wages, they are only too glad to make an extra effort. The men should be dealt with individually as far as possible. The force of this is apparent when a man is taken from day labour and given contract work. He immediately realises that a premium is being offered for better work and can see some tangible reason for making a greater effort. It is generally recognised that any system of efficiency that does not provide for a division of the benefits to be derived from any change which affects labour, will prove a failure, and while a large percentage of the men working underground may not be able to speak English fluently, there are few who, at the end of the month, do not know approximately what they have made and a settlement on any basis will not prove conducive to the best results. There are conditions in which it is rather difficult to figure a contract basis. For example, in the Lake Superior copper district, the cost of copper per pound depends upon the quality of rock hoisted as well as the quantity. This necessitates underground sorting, which item is a large proportion of the underground expense. When this operation is placed on a contract basis, the quality of the rock decreases and the quantity increases as well as the cost of copper per pound. To a certain extent, efficiency work is a matter of education. While a practical training is absolutely necessary to one who in any way has charge of men or is planning work, it is of prime importance that they be able to appreciate the value of figures. The result of a time study placed before some of the older mining captains would produce about the same feeling toward them as the man lost in the woods has toward his compass. He will agree that they ought to be right, " but that they are certainly off this time." In the majority of cases the men themselves may be taught to accomplish the same or greater results with an expenditure of less physical force. This cannot be done by simply explaining the method but must be demonstrated. It may be necessary to take four or five cuts out of a drift before you can convince a gang that they are not placing their holes to the best advantage. This part of the system of education is usually left to the boss, whose territory is so great that he cannot give sufficient time to any individual gang or operation to get the best results, and too often his attitude toward the men may be that if they do not get the best results, they are on a contract and they, not he, will be the losers. There are many other conditions which have a direct bearing on the efficiency of labour, some of which are of such nature that the results cannot be measured in dollars and cents. For instance, one large copper mine in the south-west employs an expert to provide ventilation for stopes where the air is too hot or impure. Sociological and welfare work, which might be considered a dead expense, undoubtedly has a direct bearing on the efficiency of labour, in tending to preserve the health, loyalty and continuity of an organisation. If it were possible to determine to what extent the cost per ton of ore or per pound of copper were affected by this expenditure, it would doubtless show a balance on the credit side.

Rhodesian Section.

LATEST MINING NEWS.

North Charterland Exploration—The Union Miniere—Jumbo and Pickstone Gold Mines—The Wanderer—Transvaal and Rhodesian Estates.

The directors of the North Charterland Exploration Company (1910), Ltd., in submitting their report for the year ended June 30 last state that the profit and loss account shows a debit balance of £2,397, and this together with the debit at June 30, 1912, shows a total debit balance to date of £10,887, of which amount £4,030 represents preliminary and new issue expenses.

* * * *

The Union Miniere: The production of the Lubumbashi smelters now averages about 1,000 tons of copper ingots per month, and in a few months the average will reach some 1,400 tons monthly. The activity of the smelters has been slackened recently, on account of the damage caused by the torrential rains to the railway from Kambove, it being impossible to ship ore from the mine. Mr. Archer Wheeler, a former superintendent of the Anaconda, the famous American copper mine, has been appointed consulting engineer to the Union Minière, and in this capacity he is leaving for the Katanga on an inspection tour.

* * * *

The following cablegram was despatched in mail week by Col. R. Grey to the London office of the Jumbo Gold Mining Co.:—"Recent developments south cross-cut main incline shaft unsatisfactory. C. E. Parsons proposes to reduce work No. 4 level and cross-cut No. 5 level, endeavouring to cut lode. C. E. Parsons proceeding examine the property; shall telegraph you on his return."

* * * *

The report of the manager of the Pickstone Gold Mines on operations during the month of March states that the footage accomplished was 521. The 10-stamp mill with one Chilian ran 600 hours, and crushed 3,547 tons of ore. 1,930 tons of sand were treated and 1,544 tons of slimes. The total gold recovery was 914·11 ozs., valued at £3,841. The working profit for the month, after deducting royalty, was £975. The capital expenditure during the period amounted to £1,117.

* * * *

The development report of the Wanderer Company for February states that the footage accomplished amounted to 433 feet, of which 226 feet were in the south section of the Wanderer. On the adit level the result of the month's development were discouraging; the footwall section, however, has improved. The 70 ft. level drive S. and cross-cuts have opened up profitable ore during the month, but are now in a barren zone. Good progress has been made on the 140 ft. level during the month. In the Ashton and Kemerton sections, no further profitable ore has been exposed, but the results of the month's development are encouraging.

* * * *

In their annual report the directors of the Transvaal and Rhodesian Estates, Ltd., state that the company's mining interests in Rhodesia are under the direct supervision of Mr. Sydney Dyer. Development work carried out on claims in the Shagari and Hartley districts has proved of a disappointing character, and certain of these interests have consequently been abandoned. A full measure of compensation, however, has been afforded by the highly satisfactory development of the Fred mine in the Filabusi district, which represents the company's most important mining asset. Since the date of the last report, further claims have been acquired and the Fred mine now consists of 70 claims. The development work carried out has warranted the erection of an additional five stamps, and there is now a 10-stamp battery with complete cyanide plant at work, capable of treating 1,500 tons monthly. The experience of past working shows that an extraction of about 94 per cent. is obtained. The main shaft has been sunk to the 460 ft. level, and a crosscut therefrom has cut the reef at this depth. A west drive at this level has been extended along the reef 22 feet, showing an average assay value of 16 dwts. over a width of 2 ft. 6 ins. Two winzes have also been sunk from the 350 ft. to 460 ft. level, showing the average assay value of the reef in these winzes to be approximately 1 oz. per ton over a width of 2 ft. 6 ins. From one of these winzes, drives east and west have been made, showing the average assay value of the reef for a total length of 54 ft. to be 1 oz. 8 dwts. per ton over a width of 2 ft. 6 ins. There are now some 30,000 tons of ore developed, of an approximate value of £120,000. The quoted investments at market prices at December 31 last showed a depreciation of £6,712, which the directors have written off.

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"S.A. MINING JOURNAL"

Special Mining Exhibition and "Safety First" Supplement,

TO BE ISSUED MAY 23rd, 1914.

A Special Illustrated Supplement will be included in the "S.A. Mining Journal" of May 23rd, dealing with the Third Annual Mining Exhibition. Among the chief contents will be the following:—

LEADING FEATURES.

The Use and Function of Mining Exhibitions.
Chemical and Metallurgical Apparatus at the Exhibition.
Mining Machinery and Models on View.
Some Natural Products of S.A. and their Industrial Possibilities.
The Promoters and Organizers of the Exhibition (illustrated).
New Devices and Labour-saving Inventions (illustrated).
Some Rock Drill Exhibits.
The New Hammer Drills and their Significance.
Some Stamp Battery Improvements.
The Progress of Modern Wire Rope Manufacture (illustrated).
Important Metallurgical Specialities.
Mine Rescue Apparatus and "First Aid" Appliances.
Results of S.A. Red Cross Society Competitions.

SPECIAL "SAFETY FIRST" SECTION.

The "Safety First" Committee Competition.
Winning Ideas and Devices (described and illustrated).
Progress of the "Safety First" Movement on the Rand.
A Review of Work Done by the "Safety First" Committee of the Rand Mutual Assurance Company.
Results of the Movement Elsewhere.
"Safety First" Devices (illustrated).
The Mines Department and the Movement.
The Mines Department Accident Museum (illustrated).

THE SOUTH AFRICAN MINING JOURNAL

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THE APRIL OUTPUT: GROUP RETURNS.

Better Profits for a Short Month.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of April:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	66,000	16/ 0	19,962	£30,857
Geldenhuis Deep	300	7	48,000	23/ 3	15,934	11,000
Nourse Mines ...	260	7	43,500	19/11	13,582	13,629
Ferreira Deep ...	260	7	54,100	17/ 9	24,828	56,088
Crown Mines ...	660	26	184,000	15/ 8	58,149	99,841
Durban Rood. D.	100	3	24,840	23/ 7	7,957	4,073
Totals & averages	1880	57	420,440	17/ 9	140,412	£215,488

The following are the results of crushing operations of Central Mining companies for the month of April:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	34,200	15/ 6	14,462	£34,263
New Modder ..	180	7	51,000	15/ 1	21,790	52,968
City Deep	150	9	41,500	22/11	19,873	35,527
Village Deep ...	180	7	50,300	16/ 9	16,541	27,158
Village Main Reef	160	6	30,050	19/ 1	15,007	33,849
Robinson	250	6	50,300	14/ 2	20,562	50,296
Bantjes Cons. ...	100	3	22,300	20/ 6	6,508	4,440
Totals & averages	1100	43	279,650	17/ 4	114,743	£238,501

Barnato Group.

The following are the operations of the Barnato Group for the month of April:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.	Gross Profit including sundry Revenue.
Cons. Langlaagte ...	90	47,100	£58,952	£23,316
Ginsberg	75	14,513	17,982	4,610
Glencairn	160	20,500	15,084	2,823
New Primrose	155	22,900	26,121	11,519
New Rietfontein ...	55	6,631	6,643	1,074
New Unified	60	12,430	14,083	5,191
Quest	35	4,231	2,810	421
Van Ryn Deep	80	40,000	66,260	32,007
Witwatersrand	210	38,430	47,677	23,532
April totals ...	920	206,735	£255,612	£104,493
March totals ...	905	210,006	£257,366	£104,704

Monthly gross profits: January, £87,277; February, £94,055; March, £104,704; April, 104,493.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of April, 1914:—

	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	11,090	£8,816	£583
Princess Estate	60	5	22,500	28,488	2,409
Geduld Proprietary ...	50	5	17,300	28,216	6,691
	210	10	50,890	£65,520	£9,683

The decrease in the tonnage crushed by Geduld Proprietary Mines, Ltd., and consequent increase in cost is due to a breakdown of the mill hoist during the month.

The Albu Group.

The following are the details of results regarding the April operations of the producing mines of the General Mining and Finance Corporation Group:—

Company.	Stamps.	Tons Crushed	Total Cost.
Aurora West	80	8,706	£14,559
Meyer and Charlton	75	14,736	12,252
New Goch	120	29,300	21,413
Roodepoort United	55	23,009	21,031
Van Ryn	140	38,600	31,041
West Rand Consolidated ...	100	26,100	26,025
	570	140,451	£126,321

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	33/ 5·3	£11,711	*£2,848
Meyer and Charlton	16/ 7·5	34,427	22,175
New Goch	14/ 7·4	32,120	10,707
Roodepoort United	18/ 3·4	21,979	948
Van Ryn	16/ 1·0	54,119	23,078
West Rand Consolidated ...	19/11·3	33,684	7,659
		£188,040	£64,567
Less Loss—Aurora			2,848
Nett total profit			£61,719

* Loss.

On the 31st March the headgear at the Aurora West was damaged as the result of an accident in the shaft, causing the suspension of hoisting during the first 13 days of the month This stoppage, coupled with the fact that all expenditure involved in the repairs has been debited to working costs, accounts for the loss sustained. Since the resumption of operations normal conditions have prevailed.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of April, 1914, of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	68,000	14,819	£25,083
Robinson Deep ...	115	8	44,660	14,365	25,061
Knights Deep ...	400	11	103,400	16,351	9,839
Simmer Deep ...	180	9	49,950	9,538	2,803
Sub Nigel	25	1	4,600	2,171	1,904
Totals	1040	36	270,610	57,244	£64,690

Total gold in reserve:—Simmer and Jack, 2,250 ozs.; Robinson Deep, 1,866 ozs.; Knights Deep, nil; Simmer Deep, 1,227 ozs.; Sub Nigel, 900 ozs.; total, 6,243 ozs.

The sundry revenue included in the above total declared profits is as under:—Simmer and Jack, £2,500; Robinson Deep, £60; Knights Deep, £220; Simmer Deep, £357; Sub Nigel, £206; total, £3,343.

East Rand Proprietary Mines.

Appended are the results of last month's operations at the East Rand Proprietary Mines:—820 stamps milled 140,000 tons; 50,234 ozs. of fine gold recovered, valued at £211,117, including 2,144 ozs., valued at £9,009, recovered from the accumulated slime. Profit for the month, £63,983, including £7,798 profit from treatment of the accumulated slime.

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Engineering Notes and News.

RECENT AMERICAN MACHINE DESIGN.

A Condensed Review of Latest Progress and Improvements.

[BY P. B. MCDONALD.]

Recent changes in the design of American mining machinery have been prompted as much by a widespread demand for greater efficiency as by the notable increase in the use of electricity for mines. "Efficiency engineering," introduced into the mining business on account of its success in factories and machine-shops in the eastern States, has not been particularly successful in its effect upon the miners, but has undoubtedly benefited the mining machinery trade. The tendency has been to develop special machines for the different grades of work; thus, in the matter of rock drills, special models for soft, medium, and hard rock have been perfected through co-operation between the mining companies and the manufacturers. The notable tendency for consolidation and centralisation among mine operators has aided in the systematic attention given to such matters. This, with the perceptible lowering in the grade of ores, has furnished a greater impetus to mine machinery than had occurred in years. The increased use of electricity in mining has been due to the numerous water-powers available in many mining districts. In some districts electric power can be purchased from power companies, which make a speciality of selling to mines; the prices vary a good deal, and may be $30 or $40 per horse-power per year, or at the rate of 1 cent. per kilowatt-hour.

Air Compressors.—The most notable improvement in mine air compressors has been in the development of electrically driven compressors. Realising the growing tendency to utilise electricity at the mines, several manufacturers have produced very satisfactory electrical compressors. The greatest obstacle was the slow-moving feature of air compressors, compared to the fast-revolving machinery for which electricity is best adapted. The types of compressor perfected include both belt-driven and direct connected machines. Contrary to first predictions, the direct connected types are working very well. The problem of adjustment of compressed air to meet the varying needs in the mine has been solved by various ingenious devices differing with the manufacturers. One such adjustment is known as the "clearance control device"; as the pressure in the air line rises, this device automatically opens pockets connected with the air cylinders. This has the same effect as lengthening the cylinders, as air is compressed into the pockets and then released: hence the name "clearance control." There are four pockets to be opened, depending upon how much the supply of air needs to be cut down. The amperage drops during the operation of cutting down, so that current is economised. In some mines electrical air compressors give such satisfaction, and electrical power can be purchased so cheaply, that the hoisting and pumping are accomplished using compressed air, no steam being necessary at all.

Hoists.—The matter of hoists has received considerable attention recently. The fact that mine hoisting is an intermittent operation has presented a number of problems, especially to steam designs, so that improvements were difficult. Theories that looked well on paper were found not to work in practice, and experience has dictated most of the changes. The larger and deeper mines have tended to instal a skip hoist and a cage hoist. The former, for hoisting ore, is usually a direct connected or "first motion" hoist; the latter is generally a smaller and geared hoist, and is used for hoisting men, lowering timber, supplies, etc. In spite of the initial difficulties encountered, electric hoists are proving popular. At some mines steam is used at a central power plant to generate electricity, which is transmitted conveniently to the several shafts, where small electric hoists are located. At mines where electric power is brought in from some distance, motor-generator sets are sometimes installed. These are costly and elaborate, but are economical and convenient for permanent use. The power is received usually as alternating current of high voltage, and goes to a motor, which actuates the "set," generating direct current of low voltage in two generators, one of which is for supplying the skip-hoist and one for the cage hoist. Also on the line shaft is a heavy flywheel, made perhaps of layers of sheet steel rivetted together. This flywheel, with the aid of an automatic slip regulator, maintains practically a constant load on the transmission line. That is, a small amount of current used continuously keeps a line shaft revolving at high speed, from which power for intermittent hoisting of much greater horse-power is furnished. This is very desirable from the point of view of the power house. A motor-generator set, as described above, may be so well balanced that it requires three or four hours to stop revolving after power has been shut off. The mechanical features of the electric mine hoist have been pretty well solved, so that a hoisting engineer can control matters with only two levers to throw; the mechanism is in some respects similar to that on a trolley-car. "Herring-bone" gears for hoists are being introduced.

Drill Sharpeners.—One type of drill sharpener has lately had much success; some of the inferior types are not as satisfactory as the old fashioned hand sharpening. The former types generally held the drill steel out and banged away at the bit, incidentally bending and crystallising the steel. The new type uses a greater number of light, quick blows, but essentially is a compressed air vise, which presses and moulds the bit while it is being sharpened. This air vise principle is especially valuable in drill making, as well as drill sharpening, as dies, swages, and formers can be put in the vise, and thus the bit can be moulded into shape. No backing-block is necessary for taking up the force of the blows.

Rock Drills. Rock drills have undergone radical changes in America during the past five years. The popular old "slugger" type, rather slow and heavy, and requiring two men to operate, was formerly used for all grades of work, sinking shafts, drifting, stoping, etc. Both tappet-valve and spool-valve types were found: the former especially slow, and the latter tending to "freeze" with compressed air. Now, a number of special drills are manufactured, each a leader in a particular line. Of nearly all of them it can be said that they are essentially quicker and lighter than the old "sluggers," and strike a sharp, hard, fast blow. For shaft sinking a little, light "plugger" drill, weighing 50 or 60 lbs., is being used with remarkable success. Nearly twice the number can be used in the confined area of a shaft as would be possible with heavy drills on tripods or bars, as they are "one-man" machines, and requiring no "rigging up." At blasting time they can be removed conveniently in the hoisting bucket; holes can be drilled with them up to 10 or 12 ft. in depth. The self-rotating types are most popular. For overhand stoping, the "stoper" drills of hammer type are, of course, now widely used, as is also the case with "raising." Immense numbers of "stopers" are sold in mining districts where overhand stoping and raising are important parts of the mining method. The "hammer" principle, whereby the drill steel, instead of reciprocating, is hammered on the head, has also been adapted with signal success in one type of drill for drifting, in which the drill is mounted on a bar or column. Hollow drill steel is usually used with this type, and water or air forces through into the hole to remove the cuttings. This type of drill is getting to be very popular for hard, brittle rock, and is not intended for soft rock, where it would be liable to get stuck. For soft rock light one-man reciprocating drills are popular, mounted on extra light column or bar. For especially soft, sticky rock, but containing hard streaks, an ingenious machine has been devised, which is part drill and part a power auger. It is used in material which formerly had been drilled by hand augers. When the rock encountered is soft, it works as a power auger; if a hard streak is struck, the auger principle stops, and the hammer-drill principle automatically begins until the hard layer is penetrated. This auger-drill is a one man, plugger style. It was devised primarily for soft iron ore.—In the London *Mining Journal*.

"FIRST COST AND FINAL COST."

The Case for Cast Iron in the Water-Mains Controversy.

[By a Special Correspondent.]

As is testified by the unfortunate experience of the people of Port Elizabeth in being penalised by the vast loss involved in the renewal of important permanent works in steel not yet ten years old, few issues touch closer the public health and public purse than the respective merits of cast-iron and steel pipes for mains for gas and water. And as less than six months ago a champion of steel tubes enjoyed a "field day"—indeed, a couple of "field days"—in the columns of this journal, it has been only fair that a contributor maintaining the case for cast-iron pipes should obtain a "hearing" herein. Fair especially in the interests of the communities within the Union, who have a very real concern that right judgment in the matter should be speedily reached.

An Array of Claims Badly Perforated.

This second article in assertion of the advantages associated with cast-iron mains may properly open with replies to the claims made for steel tubes in the closing passages of the chapter printed in *The Mining Journal* for September 27. "Cheaper to instal because of long lengths and light weight." Grant that steel tubes are perhaps occasionally 20 per cent. cheaper to instal than cast-iron pipes, the saving is the merest fraction indeed as compared with the ultimate profit which accrues to the community that uses cast-iron pipes for its mains. As to the long lengths, they are certainly not entitled to the appreciation claimed for them: apart from the extreme difficulty and uncertainty attendant upon coating such lengths, the hessian coverings, which are regarded as an imperative safeguard, are always in danger of cracking, tearing, crinkling, or sagging; and when we take into account the risks from internal corrosion, it must be acknowledged that lengths of 40 ft. may well give occasion for doubts as to their wisdom. Then it must not be forgotten that the extreme length leaves the greater room for imperfect or inefficient workmanship; while the loading, transporting and handling of them is far from being as safe and easy as has been suggested. The steel tubes may now again in certain circumstances, be 20 per cent. cheaper to instal

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that cast-iron pipes, but they may be, as in Ladysmith and Port Elizabeth, 100 per cent. less satisfactory when installed, for we cannot forget that at Ladysmith and Port Elizabeth the steel pipes have been almost wholly abandoned—there is no asset even in the scrap. "The smaller (solid-drawn) sizes can be bent cold *in situ* without trouble." Such a facility should warn off all prudent purchasers; the process is the sure path to speedy destruction. "Adaptability for difficult positions." It is conceded that for temporary purposes and in situations either peculiar as to foundations or as to access, it is probably cheaper to instal ephemeral tubing and even renew it than to incur the expense of substantial works like cast-iron pipes. "Less cover required." If you grant that steel tubes may be laid nearer the surface than cast-iron pipes, it must at the same time be observed that they run the greater risk of damage from traffic and surface moistures, while it is acknowledged that every point of injury by stress or abrasion becomes an open port of entry for that deadliest of the enemies of steel, corrosion. "Friction considerably reduced owing to the smooth surface." Like the last point in the claim, this is not proved. Even if it were proved, it will be of insignificant importance, for it would not enable an engineer to save a single inch in diameter. There is, however, another point which must not be overlooked. With certain waters there is bound to be tuberculation: from cast-iron pipes this can be removed without damage by scrapers, but in the case of steel pipes there cannot fail to be ripping of the coating by the scraper, and this exposure of the metallic surface of the steel would inevitably facilitate destructive corrosion. "Adaptability for high pressure." Cast-iron pipes were doing high-pressure work before steel tubes came into being. For the high pressure hydraulic systems, working at from 750 to 1,120 lbs. per square inch, in London, Manchester, Glasgow, and the other great cities, as well as in the great dockyards, cast-iron mains are, although not cheaper for many and substantial reasons, preferred to steel pipes. "The fewer and tighter joints reduce leakage to a minimum." If the pipes are not only well made but well laid—as is ordinarily the case with cast-iron pipes—leakage should be noted with surprise. While the staving of the light steel sockets encourages leakage, the substantial sockets of the cast-iron pipes prevent it. Clearly steel tubes are on terms of intimate compaionship with corrosion and leakage; whereas cast-iron pipes have scarcely a bowing acquaintance with them. "Unbreakable" and "repairs and maintenance, nil." But the question is: Is the claim well founded? We recall that in a catalogue issued by a well-known steel tube company a certain type of tube is described as "absolutely unbreakable" from any cause; yet further on in the same catalogue in an array of "testimonials," one manager of a gas company indicates delicately that the tubes are "liable to puncture," and another gas manager confesses to "fewer fractures." The "repairs, etc., nil," point is farcical, in view of facts which are reported every now and again. Why, repairs of perforations, due to corrosion, are known to have been begun within two years of an installation of steel tubes and the tubes have had to be abandoned within five years! In Burmah at the end of only four years, an official declared that he could "put his finger through" certain steel pipes! A steel pipe at Bombay was not much better: it was abandoned after a service of only four and a half years! It is with difficulty that a certain notorious steel main can be kept in service at all even with an expenditure of over £2,000 a year upon repairs. The few breakages of cast-iron pipes reported are due mainly to accidents in their transportation and while they are being handled at the trenches. Once in the ground, they are ordinarily as safe as the permanent way of an English railway. If they ever do, from extraordinary circumstances, give out, the gush of water speedily makes you aware of it: there is no continuous, hidden, subtle, insidious leakage, producing the greatest of mischief, silently, as in the case of perforated or leaky-jointed steel pipes. This last is no light point. In the Coolgardie steel main, the discharge was reduced by leakage by 40 per cent. within seven years, and at Port Elizabeth in February of last year, the steel main which is being superseded leaked to the extent of 22 per cent. and if the damage had got no worse the supply would have leaked away completely by the end of last year.

(*To be continued.*)

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THE WEEK IN THE SHAREMARKET.

Steady but Quiet—Tins and Diamonds Weak—Dividend-Payers Firm.

The Market has been mainly characterised by quietness this week, there being little disposition to do business either way. Tins and diamonds continue to be the weak features, in both cases because of the falling prices for the products. The forthcoming diamond conference may have a favourable effect on diamonds, but fluctuations in tin which are believed to be due to the operations of a powerful "ring" are impossible to predict. All Rand dividend-payers are firm, and should go better in view of the approach of the dividend season. Modder Deeps and City Deeps are first in popular favour, and the annual meeting of the former company was most successful.

* * * *

	Fri., 1st.	Sat., 2nd.	Mon., 4th.	Tues., 5th.	Wed., 6th.	Thurs., 7th.
Adair Ushers	—	—	0 5*	0 5*	—	—
African Farms	13 0*	13 3	13 0	12 9	12 6*	12 0
Apex Mines	—	18 6*	18 0*	18 3*	—	18 0*
Bantjes Consolidated	13 6*	13 0*	14 0	13 9*	13 9§	15 0†
Benoni Consolidated	1 9*	1 9*	1 9*	1 9*	1 9*	—
Brakpan Mines	41 0*	42 6†	41 3*	42 0*	—	42 0*
Breyten Collieries	27 0*	—	27 0*	27 0*	—	27 0*
British South Africa	—	—	17 0*	—	17 0*	—
Bushveld Tins	0 9*	0 8*	0 8*	0 9†	0 9†	0 8
Cassel Coals	15 0*	15 0*	15 0*	15 0*	15 0*	15 0*
City and Suburbans	47 6*	47 6*	48 0*	48 6	48 3*	48 3*
City Deeps	64 6*	64 6*	64 0*	65 0*	66 3	64 6*
Cloverfield Mines	4 5*	4 5*	4 5*	4 5*	4 3*	4 3*
Clydesdale Collieries	9 0*	9 0*	9 0*	9 0*	9 0*	9 0*
Cons. Langlaagtes	32 6*	32 0*	32 6	32 0*	32 0*	31 9*
Cons. Main Reefs	—	17 6*	17 3*	17 3*	17 6	17 0*
Cons. Mines Selection	7 6*	7 6*	7 6*	7 6*	7 6*	7 6*
Coronation Collieries	—	—	—	—	21 0†	—
Coronation Freeholds	0 4*	0 5†	0 4*	0 4*	0 4*	0 4
Crown Diamonds	6 6	6 3*	6 3*	—	6 3*	—
Crown Mines Debentures	—	—	—	—	£98½*	—
Durban Rood. Deeps	16 6*	16 6*	—	—	—	—
East Rand Centrals	2 2	—	2 0*	2 0*	—	2 0*
East Rand Coals	1 7	1 6*	1 6*	1 6*	1 6*	1 6*
East Rand Deeps	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
East Rand Proprietary	35 9*	35 6*	—	35 0*	35 0*	35 6
East Rand Debentures	£84*	—	—	£83*	£83*	—
Eastern Gold Mines	1 0*	1 0*	1 0*	1 0*	1 0*	1 0*
Ferreira Deeps	—	—	—	—	—	45 0*
Frank Smith Diamonds	4 6*	4 7*	4 6*	4 6*	4 6*	4 6
Geduld Proprietary	—	22 0*	23 0*	22 9*	23 0*	—
Glencoe Collieries	—	—	—	7 0†	6 6*	7 0†
Glynn's Lydenburgs	—	11 3*	11 0*	—	—	11 6*
Government Areas	20 6	20 3*	20 3*	20 6	20 6*	20 6
Jhb. Board of Executors	25 0†	25 0†	25 0†	25 0†	25 0†	24 0†
Jupiters	4 3*	4 6*	—	—	4 9*	—
Jumpers	4 0†	—	—	—	—	—
Kaalfontein Diamonds	0 6	0 6*	0 6*	0 6*	0 6†	0 6†
Klerksdorp Props.	2 4*	2 5	2 4*	2 4*	2 4	2 4*
Knight Centrals	9 2	9 1	9 0*	8 11*	8 11*	8 9*
Knights Deep	36 0*	36 6	—	—	—	—
Lace Props.	3 3*	3 3*	3 2	3 2*	3 1*	3 0*
Langlaagte Estates	—	17 6*	—	—	—	—
Luipaardsvlei Estates	9 6*	9 6*	9 6*	9 6*	9 6*	9 6*
Lydenburg Farms	—	2 8*	2 8*	2 8*	2 3	—
Main Reef Wests	6 3*	6 6*	6 3*	6 3*	6 3*	6 3*
Meyer and Charltons	—	—	—	105 0*	—	—
Middelvlei Estates	1 0*	1 0*	1 0*	1 0*	—	1 0*
Modderfontein B.	81 0*	83 0	84 0†	—	—	—
Modderfontein Deeps	47 0*	47 3	47 0*	48 3	47 9*	47 6
Natal Navigation Colls.	15 0*	15 0*	—	—	15 0*	15 0*
New Boksburgs	0 9*	0 9*	0 9*	0 9*	0 9*	0 9*
New Eland Diamonds	—	—	28 0†	—	—	—
New Era Cons.	5 6*	5 6*	—	5 6*	5 8*	5 6*
New Geduld Deeps	1 9*	1 9*	1 9*	1 9*	1 9*	—
New Goch	12 6*	—	—	—	13 9*	—
New Kleinfonteins	23 3*	23 3*	23 0*	23 3*	23 6*	23 6
New Modderfonteins	252 6*	252 6*	252 6*	247 6*	250 0*	—
New Rietfonteins	—	—	—	3 6†	—	3 0*
New Unifieds	15 6*	15 9*	15 6*	16 0*	16 0*	16 0*
Orange Diamonds	1 6†	1 3*	1 2*	1 0*	1 2*	1 6†
Piggs Peak	9 9*	9 9*	9 9*	9 6*	9 9*	9 9*
Pretoria Cements	44 0*	44 0*	44 6*	44 6*	45 0*	45 0*
Princess Estate	5 3†	4 6*	—	—	4 6*	—
Rand Klips	2 3*	2 3*	2 3*	2 3*	—	2 3*
Rand Nucleus	1 7*	1 7*	1 8	1 7*	1 8*	1 7*
Randfontein Deeps	3 3*	3 3*	3 3*	3 3*	3 4	3 3*
Randfontein Estates	22 0*	—	21 9*	21 9*	22 0*	22 3†
Roberts Victors	20 0*	—	—	—	20 0*	20 0*
Robinson Deeps	30 0†	—	—	—	—	—
Roodeberg Minerals	24 6	24 0*	24 0	23 6*	22 9*	22 6
Ryan Nigels	—	—	3 0†	3 0†	3 0†	—
Shebas	4 3*	—	4 3*	4 6*	4 6*	—
Simmer Deeps	2 0*	—	—	—	1 9*	1 6*
S.A. Breweries	—	—	39 0*	39 0*	—	—
S.A. Lands	2 8*	2 9*	2 9*	2 9	—	2 8*
Springs Mines	12 6	12 6*	12 6*	12 3*	12 3*	—
Sub Nigels	11 0*	10 9*	10 9*	10 9*	11 0*	11 0*
Swaziland Tins	32 6*	30 0*	35 0†	35 0†	—	—
Transvaal Coal Trust	28 0*	28 6†	27 0*	27 6*	27 6*	27 6*
Transvaal G.M. Estates	36 0*	36 6*	36 0*	—	—	—
Tudors	1 0*	1 0*	1 0*	—	—	—
Van Ryn Deeps	45 3*	45 6	45 6*	46 3	45 9	45 6*
Village Deeps	37 3*	37 3*	37 3*	37 6*	38 6	37 6*
Vogelstruis Cons. Deeps	—	0 9*	—	1 0	—	0 9*
West Rand Cons.	8 3*	8 3*	8 3*	8 3*	8 0*	8 0*
Western Rand Estates	2 0*	2 0*	2 0*	2 0*	2 0*	2 0*
Witbank Collieries	43 6*	43 0*	43 6*	43 6*	43 6*	43 6*
Witwatersrands	69 6*	69 6*	69 0*	69 6*	70 0*	70 0*
Witwatersrand Deeps	53 0*	53 0*	52 6*	52 6*	—	52 0
Wolhuters	14 0*	14 0*	14 3*	14 3	14 0	13 11
Zaaiplaats Tins	27 9*	27 0	26 0*	25 0	25 0*	24 6*

MINING MEN AND MATTERS.

Mr. E. M. Weston has been appointed underground manager at the Government Gold Mining Areas.

* * * *

The Rand Mines-Central Mining group has followed the advice of General Gorgas, and has appointed Dr. Orenstein to superintend the sanitation of the whole of the mines of the group. Dr. Orenstein was one of General Gorgas's most promising assistants in connection with the work on the Panama Canal.

* * * *

When asked recently what is going on at the property of the Bullion Coalition at Stockton, Utah, General Manager E. J. Raddatz said: "Baling hay and plowing." This is the mine which last year yielded 12,000 bushels of potatoes, says the Salt Lake *Herald-Republican*. We believe several South African parallels could be instanced.

* * * *

Mr. Ernest Mott Woolley begins in *McClure's* a series of articles on "$100,000 men," with an account of Mr. Pope Yeatman. Its characterisation of this eminent and esteemed mining engineer is accurate, and some of its disclosures are quite interesting. Mr. Yeatman, it may be remembered, first made his name on the Rand. He is now with the Guggenheims.

* * * *

At the forthcoming conference in London to consider the question of limiting the production of diamonds, the Union Government will be represented by Mr. J. C. Sheridan, Commissioner for Inland Revenue. One of the German representatives will probably be Mr. A. Wagner, the late head of the Premier Diamond Mining Company, who retired to Germany some time ago. Mr. Ross Frames and Mr. Imroth will represent the Premier D.M. Co.

* * * *

Mr. R. W. Schumacher, interviewed by a Press representative this week as to constant rumours of his leaving Johannesburg, stated that for reasons of health he would unfortunately be compelled to abandon his present work before long. He was most reluctantly acting on the best medical advice. The constant strain at this high altitude was becoming too great. "It will be a terrible wrench to me," he added, "to break with the associations of more than twenty years, and to leave my work. But I am confident that I shall have opportunities from time to time of being of some service to this community and to South Africa. I feel that this must be. My future plans are quite unformed, but I expect in any case to sail for England with my family towards the end of this year."

Finance, Commerce, and Industries.

South African Coal and the Indian Trade.

Speaking at the annual meeting of the Glencoe Collieries a few days ago, the Chairman, Mr. Mackie Niven, commented upon the decrease of 100,000 tons of coal exported by the company from Durban to Cape ports, and said that one cause lay in the industrial troubles. "The main cause," he continued, "has been the competition from the Transvaal, which has been rendered possible by the low—and it is believed non-paying—rates granted for what is technically known as the 'long haul.' These low rates enable practically all the Transvaal collieries to send coal for the shipping trade to Capetown at the unprecedentedly low rate of ·15 of a penny per ton per mile, probably the world's record rate for coal, and that in a country where the cost of working the railways is not by any means the lowest. Natal's grievance is that the Transvaal collieries, on the one hand, have their geographical markets on the Rand and at Delagoa Bay, and that they have the further advantage of thick seams, and consequently low working costs; on the other hand, that Natal's geographical markets, apart from the port of Durban, are the Cape ports' coal trade, which she had at considerable expense captured as against imported coals from Europe." Concluding, Mr. Niven said:—"Export trade with India has recently received a check, owing to the serious fall in steamer freights from England to Bombay. A year ago the freight was 14s. 6d. per ton, and the last mail quotations indicate that the vessels can be chartered at 9s. 9d. per ton, or practically a 5s. per ton reduction. Welsh coal can thus drive South African coal out of the Indian market, in which we were gradually establishing ourselves, and it is more necessary now than ever that export coal rates on the railways should be substantially reduced if the Indian and Eastern trade is to be held and extended."

* * * *

Standard Bank.

In respect of the six months ended 31st December last the Standard Bank has done very well. Its gross profits exceeded the half million mark and the latest addition to the reserve raises that fund to the round £2,000,000, as compared with a paid-up capital of £1,548,500. The net profit of £169,900 is £11,000 more than a year ago. There is no change in the dividend and bonus, which are at the substantial rate of 14 per cent. per annum, while £15,000 is placed to premises account, £10,000 to reserve fund, £10,000 to pension fund and £25,000 to depreciation of investments. A year ago only £15,000 was written off investments, the other allocations being identical with those now made. The carry forward is £52,100, as compared with £50,200 a year ago. Evidence of a larger business done is to be found in several items of the balance sheet, notably in the loans and discounts, which stand at £13,062,900, as compared with £12,180,900 at the corresponding date in 1912. The deposit and current accounts have increased slightly and now amount to £20,900,300.

* * * *

Public Works Expenditure.

In the course of his Budget speech, General Smuts announced that the total loan expenditure for 1914-15 would be £5,719,558. The White Paper giving details of the estimates of expenditure from loan funds is since to hand, and shows how the amount is to be spent. Railways and harbours account for £2,500,000; public works, £531,358; telegraphs and telephones, £277,000; lands and settlements, £232,209; irrigation, £55,000; local works and loans, £876,000; land and agricultural bank, £750,000; agriculture, £300,000. The two and a half millions for railways and harbours are to complete works in hand or already approved. The public works estimates comprise £516,858 for buildings and £14,500 for bridges. The Department of Native Affairs requires £14,500 of this, £9,000 being for works in hand, and the remainder for new works in the shape of public offices and so on. The Department of the Interior has a still bigger programme of works in progress or in contemplation. Under the former heading is included the schemes for remodelling and providing additional accommodation at the principal lunatic asylums. £30,000 towards the improvement of the Bloemfontein Asylum, and £30,000 for Valkenberg, are the two principal items in the proportion of expenditure for 1914-15 under this head. The Agricultural Department provides, among the rest, £10,000 towards the cost of the Cedara Agricultural School; £28,000 out of a total estimated cost of £42,000 for the new agricultural school at Glen, near Bloemfontein; £2,000 out of a total of £100,000 for the Pretoria Agricultural College, etc. Of the £277,000 allocated to telegraph and telephone construction £101,345 is for additions or new works (telephones) in the Cape Province, and £9,010 for the Cape telegraph system. Under the head of irrigation the total of £550,000 is made up of £194,000 for Government works and boring, and £356,000 for irrigation loans. The £194,000 includes £2,400 on account of the Douglas irrigation works extension, the estimated total cost of which is £8,500.

* * * *

Against the Taxation of Site Values.

Two interesting methods of raising money to meet the heavy cost of Local Government were examined by the British Committee on Taxation, which has just reported. "The Committee is unanimous in rejecting a local income tax as impracticable, for administrative reasons; and of its thirteen members, seven will have nothing to do with the rating of site values either in partial or entire substitution for the present rate, while six of its members favour a rate on site values as a partial substitute for the present rate. Here are the reasons why the Committee declare against a rate on land value:—"(1) That the benefit derived by landowners (using the term in its broadest sense) from the general activity and expenditure of the community is not sufficient to justify the charge of the whole cost of local government, present and prospective, on this class. (2) That a large part of this benefit is due to other causes than the activity and expenditure of the persons living in the local government area or areas in which the land is situated. (3) That other classes of the community derive benefit from communal services, and that many of these would not contribute towards the cost of such services, either directly or indirectly, under the proposed basis of rating. (4) That a system of rating upon land values would, they believe, tend to increased congestion of buildings. (5) That the proposal, if adopted, to give the occupier the right of deducting the rate from his rent would dangerously reduce the number of ratepayers and would tend to deplorable results in local government. (6) That the defects and inequalities of the present system, *e.g.*, its effect in discouraging the improvement of rateable premises, are unduly emphasised by those who support the change, while it is doubtful whether the alternative system proposed would give rise to fewer defects and inequalities." Nor are they able to recommend the imposition of a rate upon land values alongside of the present system. They contend that, while it may be the case that landowners derive a greater benefit from the activity and expenditure of the local community than is represented by their indirect contribution under the present rating system, it should not be overlooked that the situation has been greatly altered by the new taxation under the Finance (1909-10) Act, under which an annual impost based on the site value is laid upon the owners of the undeveloped land, and a specific tax is imposed on increments in site value whenever realised. These methods of taxation appear to be more equitable than the imposition of rates on site value.

The Sheba.

The following are the results of operations at the Sheba Mine for the month of April, 1914:—Crushed 6,300 tons, yielding 3,211 ozs.; estimated profit, £4,000.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of April, 1914:—Central Mines: Tons crushed, 11,650, yielding 7,125·888 fine ozs. Elandsdrift Mine: Tons crushed, 685, yielding 750·963 fine ozs. Vaalhoek Mine: Tons crushed, 1,400, yielding 570·151 fine ozs. Estimated value of output, £35,422; estimated profit for the month, £19,329. The decreased profit is due to a slightly lower grade and to the loss of two days, owing to a public holiday and breakdown of the power line. It is anticipated that next month will show an improvement.

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INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

May 15.—Bucks Reef (special); Marievale Nigel; Wit. Deep (annual).
May 20—Apex Mines, New Kleinfontein (Annual).
May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).
May 27.—Consolidated Langlaagte Mines; Ginsberg; Glencairn; Government Areas; New Primrose; New Rietfontein; New Unified; Van Ryn Deep; Witwatersrand G.M. (annual).
May 28.—West Rand Consolidated; Roodepoort United; New Goch; Meyer and Charlton (annual).
May 29.—Cloverfield, Vogel Deep, Knight Central (annual); Aurora West, Cinderella Consolidated; New Steyn Estate; Rand Collieries, Sacke Estates (annual).
June 2—Modder B; [illegible] (annual).
June 3—Crown Mines, Durban Roodepoort Deep, Village Deep (annual).
June 17—S.A. Gold Mines; Leeuwpoort Tin; African Farms.
June 22—Robinson Deep (annual).
June 23—Transvaal Consolidated Lands (annual).
June [illegible]—A. Goerz & Co., Ltd. (annual); Robinson G.M. (annual).

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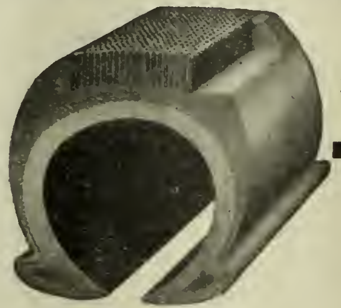

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The Week's Company Meetings.

MODDERFONTEIN DEEP LEVELS.

Excellent Prospects.

Position at Mine.

The thirteenth ordinary general meeting of the shareholders in the Modderfontein Deep Levels, Ltd., was held this week in the Board-room, Silesia Buildings.

Mr. H. Neuhaus was in the chair and among those present were Messrs. A. Ross, T. Suter, C. Sonn, H. W. Anderson, W. R. Crowhurst, F. W. Baxter, F. Hesselberger, F. R. Lynch, D. C. Greig, V. J. Ronketti, A. D. Viney, Gordon Sandilands, M. Rode, Dr. Donaldson, and the secretary, Mr. C. L. Chambers—representing 207,825 shares out of 394,500.

In moving the adoption of the report and accounts the Chairman said: The task of reviewing the results of the work done since last I addressed you is a very pleasant one, as indeed you must have anticipated from a study of the reports for 1913, which have been in your hands for some time. These, together with the quarterly reports regularly issued, have kept you closely in touch with the position of affairs, and clearly show the great progress made towards bringing your company's property to the producing stage and the excellent results which have been obtained. Turning first to the finances of the company, you will remember that in August last the development of your property had advanced sufficiently to enable your Consulting Engineer to formulate definite plans as regards a reduction plant. Shortly put, his recommendation was that a plant capable of milling 30,000 tons per month should be erected in time to commence crushing about the end of the current year. An agreement was consequently concluded with Messrs. A. Goerz and Company, Limited, under which 131,500 new shares were offered to you at 30s. per share, the firm guaranteeing the issue at that price and receiving in consideration thereof a commission of 2s. 6d. per share offered and an option over a further 105,500 shares at 35s. per share till 30th September next. The result of the offer to you convinced your Board that it had been very wise in making this agreement with Messrs. A. Goerz and Company, Limited, for less than 1 per cent. of the shares offered were actually applied for. The issue provided the company with the sum of £180,812, of which amount there was left at the end of April some £50,000. If the option is exercised, and this will, it seems, certainly be the case, the company will receive a further £184,626, and its issued capital will then be £500,000. It is unlikely that the expenditure to be incurred before the first gold is received from productive operations will exceed the working capital so provided by any consderable amount. A close estimate cannot be made as the amount to be spent underground on development, etc., is obviously largely dependent on the available labour supply, which, I am pleased to say, is quite satisfactory at present.

Development Pushed Ahead.

The provision of this money has enabled development to be pushed ahead in all directions. Only one serious interruption has occurred—in June, when a large quantity of water was encountered and development work had to be temporarily suspended. Practically simultaneously the workmen employed by your company struck, with the result that development was interrupted altogether for about a month. Had it not been for this interruption the footage for the year would have been some 2,000 feet more. The strike of white employes also affected the native labour supply, and consequently the footage during the following months was not quite as large as it would otherwise have been. Nevertheless, the excellent total of 16,518 feet of work was accomplished in 1913, and 4,256 feet were driven, risen and sunk in the first quarter of this year. This latter figure would have been even greater but for the strike in January, which impeded development for a short time. In April the record footage of 1,742 was accomplished. The incline shaft has made splendid progress and should be completed in a few months, that is to say, well before crushing starts. All the samples taken in it have disclosed excellent values. The quarterly increase in the footage has been accompanied by a progressive improvement in its value, the total of 16,492 feet sampled to March 31st. giving an average value of 9dwts. over 45.8 inches. To bring your information up to date, you will be interested to hear that in April 1,200 feet were sampled and gave a value of 10.8dwts. over 50.6 inches, thus once more showing an improvement. These results are all the more satisfactory as they include all assays whether pay or unpay and as furthermore in making up the average value abnormally high assays have been reduced.

At the end of the year, when the footage sampled totalled 13,147, the first computation of ore reserves was made. The result showed, as detailed in the reports, the total quantity of fully and partially developed payable ore to be 1,173,000 tons, assaying 7.5dwts., or 31s. 10d. over 73 inches stoping width. There were an additional 300,000 tons in respect of which some development had been done, the values of which indicated it to be probably payable ore. Including this latter tonnage, there were, at the end of 1913, about four years' ore reserves in hand. As since that date development has continued at a rapid rate and the value of the footage sampled has further improved, it is obvious that when the ore reserves are again computed a large increase will be shown. It looks as if the mine would start production with as many years' ore reserves in hand as any mine now working on these fields—a factor which is sure to be of immense benefit.

Excellent Progress in Plant Erection.

Excellent progress is also being made with the erection of the reduction and other surface plant, buildings, and so forth, and provided the manufacturers deliver in accordance with their contracts, which I expect as ample time has been given, there is no doubt that the plant will be ready to start crushing at the date anticipated, namely, at the end of this year I do not intend to detain you by giving you minute details. It will suffice to say that the reduction works will consist of sixty stamps and six tube mills, sands, and slimes plants, having a capacity of thirty thousand tons per month, excluding Sundays. The compressor power already available is sufficient for sixty-five drills; a further compressor of a capacity of a hundred and twenty drills is on order and should be erected by the end of August. Particulars of the pumping plant are contained in the reports before you. The volume of water making has fallen off considerably, and, therefore, it has been decided for the present only to instal one of the two large centrifugal pumps of which mention is made. This work will be completed in a day or two, and then the pumps erected will be capable of handling, roughly speaking, 1,600,000 gallons per day; this gives an ample reserve as at present only about 300,000 gallons per day are being lifted. There is, however, even a further reserve, as one of the shafts could, if needed, be used for baling water, without appreciably interfering with work, pending the installation of the other centrifugal pump, which could be done very rapidly.

Optimistic Forecast.

In dealing with the position and prospects of your property, I feel very much inclined to avail myself of the proverb that "Good wine needs no bush." The results of the work done to date are in your hands and you have the opinion of your consulting engineer that, on the whole, so far as disclosed, the reef conditions in your mine are very good both as to width, which will have an important bearing on working costs, and value. In addition, you have his assurance that, if labour conditions are favourable, and I am glad to say that at present they are, the mine should be ready to start producing the required ore at the end of the year, when the reduction works, as I have already stated, will also be ready. The average value of the ore reserves will give you a good indication as to the yield to be expected, and in this connection it must not be overlooked that development values have improved since they were calculated at the end of the year. Working costs should be low as the width of the reef is large, and payable ore exists in large blocks—a noteworthy feature being the consistency of values over long stretches in the drives as well as in the raises and winzes—and development, in view of the quantity of ore reserves, will not have to be pushed. Further, the plant is, of course, designed to take disadvantage of every modern improvement and the mine will benefit both above and below ground from the use of the most up-to-date labour saving appliances. Hence, there is every reason to anticipate that very gratifying profits will be earned from the beginning of milling operations.

The management of your company remained in the hands of Mr. J. P. Hussey till the 30th of September last, when, to the great regret of the board, private reasons caused him to resign. His work was greatly appreciated. Mr. H. R. Hill was appointed to succeed him. I am sure I expressed your feelings as well as those of the board when I thank your consulting engineer, Mr. W. McC. Cameron, the two gentlemen just named and their respective staffs for the excellent work which has been done. I now beg to move "that the directors' report, together with the audited statements of account for the year ended the 31st of December, 1913, be, and they hereby are, approved and adopted."

The report and accounts were adopted.

The appointment of Messrs. W. Ross and V. J. Ronketti as directors is confirmed and the retiring directors, Messrs. H. Neuhaus and F. R. Lynch were reappointed.

The auditors, Mr. Charles Stuart and Messrs. F. W. Diamond and English were reappointed.

GEDULD PROPRIETARY.

Favourable Development Position.

Extending Operations.

The thirteenth ordinary general meeting of the shareholders in the Geduld Proprietary Mines, Ltd., was held this week in the Board room, Silesia Buildings.

Mr. H. Neuhaus was in the chair, and among those present were Messrs. G. Senn, R. Heymann, W. T. Birch, F. R. Lynch, V. J. Ronketti, W. R. Crowhurst, F. Falcke, R. des Clayes—a share representation of 221,457 out of a total issue of 875,000 shares.

In moving the adoption of the report, the chairman said: The record of work done on your company's property in 1913 is dealt with very fully in the reports and accounts in your hands, and no doubt you have studied these documents with great interest. I propose to discuss the salient features, and I am certain you will agree when I have finished that I have shown that the position of the company has been greatly strengthened during the last twelve months. At the end of 1912 the company was engaged in increasing its plant to a capacity of 24,000 tons per month, for which purpose £125,000 had been raised by the issue of new shares, the balance of the cost thereof and of the extra development which was necessitated in consequence being provided out of the profits made during the construction period. Therefore the sum of £76,134 which at the end of that year stood to the credit of appropriation account was by no means wholly available for distribution The profits earned in 1913 increased this amount to £110,894, out of which sum £44,674 was spent on the objects just indicated. Hence, at the end of 1913, when this work had been completed, the balance unappropriated of £66,220 was about £10,000 lower, but it was absolutely free and represented by cash and cash assets. Since then this sum has been greatly increased by the profits made. This result has been achieved in spite of very considerable difficulties, due to causes largely outside of the company's control. During the first few months of last year the monthly profits made were, even for the plant then erected, distinctly on the small side, owing to an appreciable degree, as your chairman at the last annual meeting pointed out, to the extensive development work which was being done in preparation for the bigger plant, rendering it necessary to mill an undue proportion of development rock. Then, just when the work of enlarging the plant had been completed, the workmen on your property struck, not because of any grievance as to the manner in which they were treated dy their employers, but, as was officially stated on their behalf by the secretary of the strike committee, in sympathy with the men on strike on another property situated on the East Rand. The direct damage inflicted on your company thereby was serious enough, but the indirect loss it has since had to endure has been even greater.

Strike Results.

Under normal circumstances, in spite of the starting up of the enlarged plant, a small profit might have been expected for July. Instead of that, a loss of £13,880 was sustained after allowing for sundry revenue. August, too, was affected, for though the plant was restarted on the 15th of July after having been closed down on the 30th of June, the disorganisation was considerable and everything could not be put right in that month. It may safely be said, therefore, that the direct loss due to the strike was anything up to £20,000. The more important effect, however, was the striking change which took place in the native labour supply. Up to the time of the industrial disturbance the company was well supplied with natives. Since then its available force has been constantly decreasing and this, notwithstanding a considerable increase in its complement due to the extension of the plant. The result of this shortage of labour has been that the enlarged plant has never yet run at its full capacity. The maximum monthly tonnage so far obtained was 21,100, in October. The tonnage crushed in March of this year was 19,050, but last month it fell to 17,300, the profit being £6,675. This last decrease cannot, however, be ascribed to the native labour position, but was due to a temporary breakdown of an important piece of machinery, which, of course, has long since been put right. The profits earned have, in consequence of the low tonnage, naturally been below expectations, and their increase is dependent on a bigger quantity being crushed. It is also due to the low tonnage that the costs are not appreciably smaller. The mine is quite prepared to deliver a sufficient tonnage to enable 24,000 tons to be milled monthly. It is only the poor supply of natives which has prevented this being done for many months past. I am hopeful, however, that we have seen the worst in this respect. I have not made a direct comparison between the working results for 1913 and 1912, as, in view of the altered circumstances, I do not think it would be of any value. Such factors as are of importance are dealt with by your consulting engineer in the report which is before you. An interesting feature is the increase in the yield of 1s. 4.6d. per ton milled, thus reflecting the improvement in the value of the ore reserves at the end of 1912 as contrasted with 1911. As the result of the development work done during 1913, not only has the better value been maintained, but the developed tonnage has been considerably added to, as compared with 1912, which also registered a large addition. This is a notable achievement, particularly as, owing to the scarcity of native labour during the latter half of the year, the total development footage in 1913 was only 9,728, as against 15,118 in 1912.

Ore Reserves.

On the 31st of December last the fully developed and payable ore reserves amounted to 1,757,000 tons of a value of 6.9 dwts. over 58 inches stoping width, while a further 106,000 tons were indicated, making a total of 1,863,000 tons. Allowing for sorting this means that the mine is five and a half years ahead of its present mill when crushing at full capacity. In this connection I would particularly call your attention to the fact that for the first time in the history of the company your consulting engineer considers sufficient knowledge of the mine to have been gained to enable him to apply with safety a direct assay value to the developed ore, thus conforming to the practice generally in vogue on these fields. Your chairman last year drew your notice to the excellent development all over the mine, and especially pointed out the values in the deepest section. In view of the figures then quoted, it will be of interest to you to learn that the 3rd or deepest level has now been driven north and south for a total distance of 1,655 feet, the value being 12.25 dwts. over 40.16 inches, and that the reef in both the north and south faces is still up to this value. The rest of the development in this section—work has been practically confined to this area for many months past—is also good. Connection is now being made in a new area between the workings of Nos. 2 and 3 shafts. The last 60 feet sunk in the relative winze give a value of 16.3 dwts. over 48.4 inches, a very promising indication of an area of which little is known at present.

Working Costs.

The cost of the ore reserves per ton developed has further decreased from 2s. 3.5d. to 2s. 1.8d., or, assuming 15 per cent. sorting, to just over 2s. 6d. per ton milled. As against this, 3s. 3d. per ton milled is being written off for development redemption, so that a very conservative policy is being pursued. You may perhaps remember that formerly 4s. 6d. per ton was written off for this purpose. The reduction is due, as explained in the directors' report, to a change in the accountancy system, transferring certain expenditure to working costs direct, and thus cutting down the expenditure debited to development account. The inadequate supply of native labour has forced us to do practically all our work by means of machine-drills, and it is our policy to keep to this method. Further, it is our desire to place the mine on a single-shaft system, in the interests of health, sanitation and economy. An order has consequently been placed for an additional 75-drill compressor, which should be at work in about a year's time. It is also intended to build a railway siding, which will effect a considerable economy. Health questions have had, as always, careful consideration, and many improvements have been effected both above and below ground. The prevention of phthisis has had every attention, as on all the mines here, and conditions have been vastly improved, so much so that I am assured that, provided ordinary care is exercised, the danger of contracting this disease on these fields has become very small. It is clearly in the best interests of all concerned to make the conditions under which our employes work, both above and below ground, as good as circumstances permit. There is nothing so conducive to economy as a contented body of men. Hence your board intends to continue its efforts in this direction, and hopes, with the co-operation of its employes, to succeed in its aim. I would emphasise, however, that this co-operation is an absolute essential. As an instance I may mention the statistics analysing the causea of accidents, which show that a large proportion are directly due to the acts of the employes. I do not say that the employers cannot do more; they can, but they need, as I have already said, the hearty co-operation of the men.

Development Position.

The development position is regarded by your technical adviser to be so favourable as to justify the expectation that in due course a mill of considerably larger capacity than that now erected can be kept supplied with ore by the mine, and he adds that, if labour permitted development and incline shaft-sinking to be pushed on full speed ahead, it would be feasible to take in hand round about the end of this year the work of further increasing the plant. This expression of opinion, coming from the source it does, is all important, and indicates clearly that the potentialities of expansion of operations on your property are very considerable. The fact that so far five-sixths of the area is absolutely untouched, while the remaining one-sixth which contains the reserves is by no means fully developed and will certainly provide a tonnage for the mill much in excess of that already opened up strongly tends to confirm this indication. The opinion of your consulting engineer, which I have quoted, has been carefully considered by your board with a view to framing its policy for the future. Its acceptance necessarily means the expenditure of further large sums on capital account, which, to some degree at any rate, must be provided out of profits. Your directors feel, however, that the temporary sacrifice which you as shareholders would consequently be called on to make is one to which you must agree in your own ultimate interests, and have decided to increase the rate of development as soon as the supply of labour permits with a view to a further extension of plant at the earliest possible moment. This decision entails, as I have already indicated, important consequences. A year ago your chairman held out the hope of a dividend being declared at the end of 1913. When the time came your directors decided not to pay one, though the funds were available. This determination was due to the direct and indirect effects of the July strike. Had it not occurred, the 1913 profit would have been much larger and the company, even if a dividend had been paid, would have retained a reasonable quantity of cash for such eventualities as may always occur in the ordinary course of mining. The profits earned this year have been much better. For the four months to the 30th of April the declared working profits total £27,299, as compared with £30,735 for the whole of 1913, sundry revenue being excluded in both cases, but we are still a long way short of crushing at the rate of the full capacity of the plant. Further, there is the very important decision I have just mentioned. Hence the necessity for husbanding our resources is as urgent as ever. Therefore, though no definite decision has yet been arrived at, it is very likely that the board will resolve to defer the declaration of the first dividend even beyond next month. Should this be the case, I am sure your disappointment will only be a temporary one, for you will realise that the money is there and will be devoted to strengthening still further the position of your company. In that connection, too, you will remember that the option over 100,000 shares at 25s. per share is still outstanding. To sum up, the position of the company is a very strong one. It has a large amount of money in hand, the total quantity of ore developed is many years ahead of the present mill, and the indications afforded by the development work are such that they have caused your board to decide to push it as fast as labour permits with a view to a further substantial enlargement of the plant. Your thanks are due to your consulting engineer, Mr. W. McC. Cameron, as well as to Mr. L. A. Womble, your manager, to Mr. S. MacPhail, who has taken the latter gentleman's place while he is away on leave, and their respective staffs for the good work accomplished during the past year I now beg to move: That the directors' report together with the audited statements of account for the year ended the 31st of December, 1913, be, and they hereby are, approved and adopted.

The report and accounts were adopted.

The retiring directors, Messrs. S. Marks and F. R. Lynch, were reappointed, as also were the auditors, Messrs. F. W. Diamond and English and Mr. Charles Stuart.

In regard to the appointment of directors, Mr. Birch, whilst appreciating the value of the proposed directors, suggested that practical mining men should be put forward, and the chairman promised that the matter would have the consideration of the board. He pointed out that the gentlemen proposed had lifelong experience in the financial control of mines.

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Robinson Gold Mining Company,

LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Twenty-fourth Ordinary General Meeting of Shareholders for the year ended 31st December, 1913, will be held in the Board Room, The Corner House, Johannesburg, **on Tuesday, 30th June, 1914, at 11 a.m.**, for the following business:—

1. To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1913, and the Reports of the Directors and Auditors.
2. To elect Directors in the place of the members of the present Board, who have expressed their intention of resigning at the meeting, and to elect a Director in the place of Mr. F. G. C. E. Robellaz, who has already resigned.
3. To determine the remuneration of the Auditors for the past audit and to appoint Auditors for the ensuing year.
4. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under consideration by the Report of the Directors.

The Share Transfer Books of the Company will be closed from the [illegible] June, 1914, to the 6th July, 1914, both days inclusive.

Holders of Share Warrants who desire to be present or represented at the Meeting shall produce their Share Warrants (or may at their option deposit same), at the places and within the times following:—

(a) At the Head Office of the Company, Johannesburg, at least 24 hours before the time appointed for the holding of the Meeting.

(b) At the London Office of the Company, No. 1, London Wall Buildings, London, E.C., at least thirty days before the date appointed for the holding of the Meeting.

(c) At the Office of the Banque de Paris et des Pays-Bas, 3, Rue d'Antin, Paris, at least thirty days before the date appointed for the holding of the Meeting.

and shall otherwise comply with the "Conditions as to the issue of Share Warrants" now in force.

Upon such production or deposit a Certificate, with Proxy Form, will be issued, under which such Share Warrant holders may attend the Meeting either in person or by proxy.

By Order of the Board.

RAND MINES, LTD., Secretaries.
S. C. STEIL, Joint Secretary.

Head Office: The Corner House,
Johannesburg, Transvaal,
May 9th, 1904.

REPORT OF THE DIRECTORS

For the Year ended 31st December, 1913.

To be submitted at the Twenty-Fourth Ordinary General Meeting of Shareholders convened for Tuesday, 30th June, 1914, at 11 a.m., in the Board Room, The Corner House, Johannesburg.

To the Shareholders
ROBINSON GOLD MINING CO., LTD.

Gentlemen,—Your Directors beg to submit their Twenty-fourth Annual Report and Audited Accounts for the year ended 31st December, 1913, accompanied by reports of the Acting Consulting Engineer and Manager, which contain full details of the year's work and the position at the mine.

PROPERTY.

Claim property has not undergone any change since the previous year, details will be found in the Balance Sheet submitted.

ACCOUNTS.

The working profit for the year amounted to £724,792 7s. 5d., from which has been deducted the difference between sundry expenditure and revenue for the year amounting to £26,706 11s. 4d., making a net profit for the year of £693,085 16s. 1d., which has been carried to Appropriation Account, and with the balance unappropriated at the commencement of the year, £348,996 18s. 1d., and £1,475 16s. 11d. in respect of forfeited dividends—a total of £1,048,558 11s. 1d.—has been dealt with as follows:—

Expended on Capital Account—Equipment	£950 14 11	
Amounts paid to Government in respect of undermining rights	46,576 0 0	
		£47,526 14 11
Government Tax on profits		64,955 10 0
Dividends Nos. 42 and 43		412,500 0 0
		£524,982 4 11
Balance unappropriated represented by Cash and Cash Assets less Liabilities		523,576 6 2
		£1,048,558 11 1

Advantage was taken of an offer for the purchase of a building suitable for conversion into married quarters, an amount of £1,470 9s. 4d. being expended thereon, which, less sales of plant, £519 14s. 5d., makes a net expenditure of £950 14s. 11d. for the year. This represents the only amount expended on Equipment Account.

INVESTMENTS.

Your holdings of £50,000 Cape Government 4 per cent. Stock and £10,000 Crown Mines, Ltd., 5 per cent. Debentures have been disposed of during the year.

A further 38,162 shares of 10s. each were purchased in the Crown Mines, Ltd., bringing this Company's shareholding to 40,000 shares.

The whole of the Investments held have been written down to the market value as at 31st December, 1913, which necessitated the writing off of an amount of £59,535 16s. 2d.

Two dividends (Nos. 24 and 25) of 55 per cent. each, have been declared by the Crown Mines, Ltd., the amount accruing to this Company therefrom being £21,817 19s.

DIVIDENDS.

Two dividends have been declared during the year (Nos. 42 and 43) of 8 per cent. and 7 per cent. respectively, absorbing £412,500.

DIRECTORATE.

In accordance with the Circular of the 7th February last, the Directors have notified the Company of their intention to resign office, such resignation to take effect at the Annual General Meeting. This step has been taken owing to the form which the opposition to the proposed amalgamation with the Crown Mines, Limited, took, and in order to test whether the want of confidence in their management shown thereby is endorsed by any considerable portion of the Company's shareholders. The Directors have declared themselves prepared to accept re-election should shareholders so desire. As intimated in the notice convening the Annual Meeting, Mr. Robellaz has already resigned.

AUDITORS.

You are requested to fix the remuneration of the Auditors for the past audit and to appoint Auditors for the ensuing year.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

CONTENTS.

PAGE
Notes and News 295

Topics of the Week:

The "Colour Bar" and the Union Parliament ... 297
Miners' Phthisis Compensation Methods 298
The Miners' Union make a "Dead Set" on Randfontein 299
The Folakara Oil Fields 300
Progress of Messina Copper 300
The Manager and Staff of the Simmer and Jack Proprietary Mines 301
South African Survey Practice 302
Modder Government Areas 303
Position of the East Rand Proprietary Mines 305
Tin and Copper Prices 306
Asbestos and Chrome Iron in Rhodesia 307

Rhodesian Section:

Latest Mining News 308
Correspondence and Discussion: "South African Investments"; "First Aid v. Safety First"; "Madagascar Conditions" 309
April Gold Output in Detail 311
Mining Men and Matters 312
Engineering Notes and News 313
"First Cost and Final Cost"—II. 313
The Development of Tube Mill Linings 315
The Care and Protection of Wire Ropes 316
Finance, Commerce and Industries 317
Quarterly Reports 318
The Week in the Sharemarket 319
New Registrations 320

Notes and News.

The Mining Exhibition and "Safety First."

The third annual Mining Exhibition, under the auspices of the Chemical, Metallurgical and Mining Society, will be opened next Tuesday by Mr. E. A. Wallers, the President of the Chamber of Mines. The Exhibition bids fair to be the most successful of its kind ever held on the Rand, and its interest and value will be largely enhanced by the participation of the promoters of the "Safety First" movement. With our next issue will appear a special supplement dealing with the chief features of the Exhibition, and dealing authoritatively and exhaustively with the "Safety First" movement, its history, progress and growing popularity on the Rand.

* * * *

Transvaal Landowners' Protest.

The Transvaal Landowners' Association met this week, and entered a strong protest against the land taxation proposals of General Smuts. An influential deputation appointed by the Association leaves this evening to interview the Minister and lay before him the case for the landowners. It is known that stalwarts of the South African Party are making big efforts to fight the tax, and they will naturally welcome the support afforded by the Transvaal landowners' action. The developments of the next few weeks will, therefore, be followed with interest.

* * * *

A New Pilgrims Rest Venture.

A new private company has recently been floated under the name of the New North Clewer, Limited, with an issued capital of 20,000 shares of £1 each. The mine is situated in the Pilgrims Rest district, adjoining the Transvaal Gold Mining Estates, and the property forms the largest consolidated block on the Theta Reef outside that well-known property. The claims are situated principally on the west of the Columbia dyke, on the same side as that wonderful bonanza of the Transvaal Gold Mining Estates, better known as the Duke's Hill Channel, the Columbia Hill and the Peach Tree Mines. Mr. Von Dessauer has been appointed consulting engineer to the company, and under his direction a vigorous policy of development on new lines has been started. In that gentleman's opinion the funds available, especially taking into consideration a reserve issue which has been created, are more than sufficient to fully equip the property and bring it to the producing stage. The vendors have shown their faith in the venture by taking the whole of their interest in shares, and the directors have agreed to forego all directors' fees. In the opinion of the directors there is no doubt but that the prospects, especially taking into consideration the very small capital, are most promising, and the future of the property will be watched with interest.

* * * *

"Safety First."

Attention is drawn to the fact that "Safety First" lectures on mine accidents will be given by Mr. A. M. Archbold, Deputy Inspector of Mines, Krugersdorp districts. The following is the list:—No. 1 lecture, "Accidents due to Falls of Rock"; No. 2 lecture, "Accidents due to Explosives"; No. 3 lecture, "Miscellaneous Mine Accidents, Shaft Accidents, and Accidents due to Carelessness, Ignorance and Negligence."

* * * *

Reef Classes for Officials.

The remarkable success of Prof. Yates' students in the examinations for Government certificates has resulted in the Professor receiving numerous requests to open teaching centres along the Reef, in order to meet the convenience of many mining men who are unable to attend the town classes. It has therefore been decided to form classes at Randfontein, Roodepoort, Crown Mines, Rose Deep, East Rand, New Modderfontein, or any other centre, provided a sufficient number of applications are received. The next term for managers' certificates will commence about the 25th inst., and all classes, both in town and along the Reef, will be taken by Professor Yates personally.

*   *   *   *

The Conference on the Diamond Industry.

The conference to be held in London in reference to the limitation of the diamond output will have its first sitting on the 15th of June. The Union Government will be represented by Mr. J. C. Sheridan, Commissioner of Revenue; De Beers Consolidated Mines, Ltd., by Sir Carl Meyer, Bart., Mr. Hirschhorn, and Mons. A. Viallate; the Premier Mine by Mr. Percy Ross Frames and Mr. Gustav Imroth; and the Jagersfontein Company by Sir David Harris, K.C.M.G., M.L.A. The German Government will also be represented in respect of the interests in South-West Africa. Some objection has been raised in Bloemhof district that the alluvial diggers will not be represented, but, so far as this matter is concerned, it is held by those *au fait* with the objects of the conference, that the interests of the alluvial diggers will be well served by any steps taken to limit the production being placed on the market, because the price of stones will be increased. The output from the alluvial diggings is very small compared with that from the mines, and there would be difficulty, owing to the peculiar conditions of the individual digger, in restricting that output, even if there was any desire to do so.

*   *   *   *

The Competition for Capital.

The figures showing the destination of new capital raised in London for the first quarter of the current year are important from the South African point of view. Owing to the relaxation of the stringency of the money market, the aggregate amount of the total applications for capital during the first quarter of 1914 was very nearly half as much as was asked for during the whole of last year. The total for the whole year (1913) was roughly 196½ millions sterling. The total for the three months ending March 31st, 1914, was 97½ millions sterling. Of this enormous amount 46¾ millions went to the British Possessions, and here comes the feature of interest to the Union of South Africa. Out of this 46 odd millions Canada secured nearly 21 millions, having had nearly 10 millions in the corresponding period of last year, and 3¾ millions in the first quarter of 1912. Australasia had 13½ millions, having had 10¼ millions in the first three months of 1913, and about 1¾ millions in the corresponding period of 1912. The corresponding figures for South Africa in 1912, 1913, and 1914 are £1,207,300, £15,000, and £5,122,000. Of this last five millions, four millions are on account of the Government, and £750,000 on account of the Pretoria issue in February. This leaves £372,000 for the development of private enterprise in the Union; and of this amount the only contribution to mining enterprise was £210,000 for the Cape Copper Company.

*   *   *   *

A Fortunate Discoverer.

A visitor to Kimberley last week-end, says the *Diamond Fields Advertiser*, was Captain Reginald Turner, D.S.O., mining engineer, who is on his way from Rhodesia to England in connection with a big industrial and commercial enterprise following the location of a large field of asbestos and chrome ore in Victoria district. Captain Turner, in a chat with an *Advertiser* representative, said that the enterprise had created somewhat of a sensation in Rhodesia, where £20,000 working capital was subscribed in four days. The property, which lies 25 miles due west of Victoria, on the Chartered Company's land, has been acquired by the King Asbestos, Rhodesia, Ltd., which is proceeding to flotation with a capital of £125,000, and, as stated, the working capital was speedily subscribed in spite of existing depression in Rhodesia. "The property," said Captain Turner, has been surveyed and reported upon by experts, whose reports were received last week. Mr. A. H. Ackermann, resident mining engineer to the B.S.A. Co., Mr. Kenrick, Mr. Clement Dixon, and Mr. Colin Campbell have all spoken in most encouraging terms of the deposits. The asbestos exists as chrysotile, and in every working sunk on the property asbestos has been found in payable quantities, while the general lay of the country in which the asbestos occurs is most favourable for economic working. The news of Captain Turner's success will be welcomed on the Rand, where he has many old friends.

*   *   *   *

The Latest Irrigation Report.

The annual report of the Director of Irrigation, Mr. F. E. Kanthack, covering the period from 1st January, 1912, to 31st March, 1913, constitutes a Blue Book of 121 pages, with maps and photographs attached. For those practically concerned, the report is of more than ordinary interest. The outstanding feature of the period reviewed was the passing of the Union Irrigation Act. Mr. Kanthack explains in broad outline the purpose and effect of the measure. The practical difficulties of framing a satisfactory water law for South Africa are great. Climatic, hydrographic, and agricultural conditions are extraordinarily diverse. Enormous vested interests have been allowed to grow up. An ideal law was no longer possible, but the opportunity afforded by Union was taken advantage of to pass an Act designed to preserve vested rights, provide for an equitable distribution, and ensure conservation of water running to waste. While the old Cape law differentiated between " perennial " and " intermittent " streams, in a manner arbitrary and in many cases ridiculous, the Union Act takes the " public stream " as the fundamental unit, and differentiates between " normal " and " surplus " flow. These and other features of the Act Mr. Kanthack succinctly elucidates. He thereafter describes the machinery created, showing the nature and constitution of Water Courts, the functions of the Irrigation Department, and the duties of River and Irrigation Boards. Having thus given a sufficient outline of the legal and administrative position to enable the report to be understood, the Director proceeds to detail the departmental operations during the fifteen months under review.

*   *   *   *

New Coal Projects.

Notwithstanding the low prices obtaining for Transvaal coal —the average selling value per ton at pit's mouth is at present about 4s. 5d.—efforts are being made to bring one or two new pits into the competitive arena. We understand that the flotation of certain new areas in the Eastern Transvaal is now being considered in London. Whether adequate capital will be forthcoming for the exploitation of these new colliery ventures or not remains to be seen, but unless an expanding export trade can be built up it is difficult to see where there is room in South Africa for many more productive collieries. The Ermelo district, in particular, is active at the present in the development of new coal-bearing areas, and amongst other properties in this locality the Ermelo Townlands Colliery is deserving of mention. Here a circular shaft is being sunk, and the management is reported to be hopeful of achieving great things in about twelve months' time. It is pointed out that the Ermelo fields are advantageously situated for participation in the export trade. This view can scarcely be quarreled with in so far as geographical situation is concerned; the debateable and big point, however, is whether railway and shipping facilities and rates are liberal enough to allow of much further expansion of our oversea coal trade, save by established producers which have already built up for themselves a profitable inland business.

TOPICS OF THE WEEK.

THE "COLOUR BAR" AND THE UNION PARLIAMENT.

Despite Mr. Malan's hopeless attitude of negative timidity, the result of the debate on Mr. Merriman's "Colour Bar" removal motion in the House of Assembly on Tuesday is a great moral victory for the supporters of the motion. Readers who have followed the articles on the subject that have appeared during recent months in these columns do not need to be reminded of the gradual, spontaneous and remarkable growth of public opinion that culminated this week in Mr. Merriman's emphatic and convincing appeal for reform. The generous fervour and high moral purpose that distinguished Mr. Merriman's moving oration rise superior even to the inevitable limitations of the telegraphed summary, and indicate that the effort was worthy of its author's great abilities and of the cause so nobly espoused. Never has Mr. Merriman appeared to better advantage. That he succeeded without apparent effort in making out an unanswerable case is shown by the debate that followed. Not one of his opponents attempted to join issue with him on the direct question. All, from the Minister of Mines downwards, pleaded that justice should not be done because of some perfectly inconsequential reason, such as that it was inexpedient, or that the time was not ripe, or that other wrongs remained unredressed. Students of Parliamentary procedure will recognise that the adjournment of the debate till next Wednesday means its shelving indefinitely; and we need not therefore fear anticipating Mr. Merriman's man-handling of his critics if we briefly indicate some of their more obvious misstatements and fallacies. Assuredly never has Mr. Duncan appeared in sorrier guise as a serious politician. Not even *Punch's* village curate could have been more dogmatic in the absence of facts than he. Not only did he give Mr. Merriman the "lie direct" in regard to the existence of the "Colour Bar" before the War, but he accused him of speaking "with no good motive," and all sorts of evil intentions. Mr. Merriman had deplored the fact that the "Colour Bar," as we know it in the mines, was only introduced by the British after the War. Mr. Duncan armed with the fact that there was a provision in the machinery regulations against coloured engine drivers of engines hauling men, before the War, flatly contradicted Mr. Merriman. Nevertheless, Mr. Merriman is right. The big question of the "Colour Bar" as it appears in all departments underground has been introduced only since the War. But the vehemence with which Mr. Duncan advanced his unverified and, as it turns out, unsubstantiated facts is nothing to the cool effrontery with which he advocates the cessation of recruiting natives from across the border of Mozambique, and by implication is prepared to offer up nearly fifty per cent. of the industry of the Rand to the pet prejudices he shares with his Labour friends. Nothing is to be gained by disguising the fact that his attitude towards this vital factor of the industry makes Mr. Duncan a destructive force that has to be reckoned with. Mr. Duncan cannot pretend he does not understand the seriousness of the blow he aims at the mining industry. It can be shown that his proposal means cutting down Rand industry by nearly half; and if this is what he has to offer to the solution of our industrial troubles, his concern about maintaining industrial peace in the interests of the workers is singularly misplaced. Then his reasons for opposing Mr. Merriman's motion read extraordinarily weak, if they are correctly reported. If all reform, however just and equitable, is to be delayed because of the temper of the Labour organizations, the sooner the Government and the mine managers abrogate their positions and authority in favour of the Labour leaders the better for the cause of peace. Indeed, Mr. Duncan's speech of Tuesday, like Mr. Creswell's, reveals him at his worst. It threw into strong relief all his inconsistencies, shufflings, and wholly impracticable ideas in regard to the vital needs of the industry, upon which we all live. In his eyes, apparently, the employers on the mines are always wrong, the men always right—oblivious to the fact that in no mining field in the world are the men better treated than here.

Mr. Creswell emerged from the ordeal in even less creditable fashion. He made great play with the fact that Mr. Merriman's plea for justice to the coloured man would actually benefit the mining industry. So extraordinary is this obsession of hatred against the unfortunate industry that the mere fact that it may be benefited thereby is sufficient in the eyes of Mr. Creswell and his fellows, to taint and destroy the fair flower of virtue in any proposal for doing justice to the coloured people. His speech admirably typifies the attitude of his party, anxious on the one hand to attract and retain the votes of the coloured people, and on the other to maintain the existing negation of industrial equality of opportunity. Mr. Creswell, of course, has not forgotten his old taunt against the industry of "importing foreign labour," and like Mr. Duncan he thought it a suitable opportunity to "rub in" this hoary old half-truth. Like Mr. Duncan, also, he is wholly unconcerned with the value of the East Coast boy to the industry, and he remains conveniently oblivious to the fact that any tampering with that portion of the labour force means more unemployment of white men, the closing down of more mines, and inevitable accentuation of the present distress. Though he trotted out all the familiar *Daily Mail* arguments against the industrial emancipation of the native, it is noteworthy that his practical experience as a one-time mine manager prevented him from endorsing the nonsensical proposition that the change would mean an increase in mine accidents. As a fact, the bulk of responsible opinion favours the view that the native or coloured man will generally "sense" danger in the mine even more quickly than his white "boss"; and it is undeniable that the concentration they display in posts of any responsibility, owing to the fewer distracting interests they possess as compared with the white man, make them, if anything, more careful and trustworthy. That he recognised this, is shown by Mr. Creswell's ignoring of the Tom Matthews' and *Daily Mail* assumptions to the contrary. Mr. Creswell, of course, could not deny the justice of Mr. Merriman's request. He had to accept the motion, but to save his face he endeavoured to nullify the effect of the reform by tacking on a wholly irrelevant motion in favour of a standard wage for all workers, whatever their colour. The two propositions are obviously quite independent and stand or fall separately. They can only be judged differently and distinctly on their merits. If the removal of the "Colour Bar" is just, it is just independent of any consideration of wages. If a standard wage is equitable, it is equitable apart from the "Colour Bar" controversy. Mr. Creswell's attitude is about as logical as that of a judge who finds a prisoner not guilty of a charge, but only allows him to go free on condition that he lives for the rest of his life on green cheese. Either he is innocent or not innocent. If the former, he should be freed unconditionally—if the latter, he should suffer the usual penalties. The second proposition tacked on to the first represents neither logic nor justice, and Mr. Creswell's impossible amendment is an insult to the intelligence of the coloured people it is designed to deceive.

The Minister of Mines was only just less unfortunate in his remarks. His historical retrospect of the evolution of the "Colour Bar" in the regulations was truer than Mr. Duncan's, though it also lacked accuracy. His final argument that the object of the motion was excellent in theory but not possible in practice is surely the last word in futility. His speech afforded no tittle of evidence as to why it should be impracticable. We must apparently be content to accept the *ipse dixit* of the Minister as all-sufficient. The metaphor of the blank cheque which was used when the Minister was given such wide powers to frame regulations under the Mines, Works and Machinery Regulations Act recurs to mind. Mr. Malan having filled up, and cashed the cheque for more than its drawers had intended, now meets their attitude of expostulation with the expressive silence of the man in possession of the proceeds. Mr. Malan, in effect, admits that a great and grievous wrong has been committed, and he stultifies himself by refusing to recognise that the admission carries with it, to all fair-minded men, the obligation to redress the evil at the first possible moment. He forgets that the Chinese slavery cry in England in 1906 was successful mainly because of its insistence on the inequity of the "Colour Bar" operating against the Chinese. He forgets that the Constitution granted to the Transvaal in the same year as a consequence of that agitation expressly stipulated against the operation of any "Colour Bar" legislation in this Province, by specifically stating that any laws passed to that effect should, in the well-known phraseology of such State instruments, be "reserved" by the Governor-General. Mr. Malan's defence, indeed, is no defence at all. It is a confession of weakness and failure to resist the steady encroachments of the Labour people on the functions and powers of the Mines Department. By the powers conferred by him on an official of the T.M.A. to have a say in the issue of blasting certificates through the new board, and on the engine drivers' union to "hold the neck of the bottle," in Mr. Creswell's expressive phrase, Mr. Malan has alienated some of the most important rights of his Department. And that doubtless is the reason why he finds himself now no longer free to do justice to one section of the workers, when that act of justice appears to conflict with the interests of the Trades Unions that now dominate the Government and the Rand.

MINERS' PHTHISIS COMPENSATION METHODS.

It is understood that as a result of the investigations into the working of the Miners' Phthisis Act by the Select Committee of the Assembly several changes are likely to be made in the measure. To our mind, in no direction is there such need for reform as in respect of the methods of the Miners' Phthisis Board, and the provisions governing the award of compensation by that body. Liberal, not to say generous, compensation to the victims of miners' phthisis has always been advocated in these columns; but any abuse of the principle must be strenuously resisted in the interests of the workers themselves. That such abuse does occur, there is abundant evidence to show. The comparatively high rate of compensation paid to phthisis victims on the Rand puts a premium on every form of misrepresentation having for its object the obtaining of that monetary award. In Western Australia, for instance, where miners' phthisis is rife (*vide* Western Australian Commission Report, 1912), no compensation is provided by the State. The same is true of other States of Australia and America. The result can be foreseen. Miners in those centres, when they become affected with phthisis, naturally make for the Rand. Here they know they can always obtain work on the mines, with the certainty of being able, in a few months, to apply for compensation. It will be asked, does not the Act provide adequate safeguards against such swindling?—for it is nothing else. The Act, as a fact, does not. What apparent safeguards there are, in practice resolve themselves into no safeguards at all. It is true, for instance, that an applicant for underground work on the Rand must be certified (under Section 25 of the Act) as sound and healthy and free from phthisis. It is provided that the certificate of any one of some fifty five general practitioners will suffice to pass the applicant; and the practice is to go from one to another of these medical men till one is found sufficiently unsuspecting or ingenuous to give the desired opinion. The general practitioner, of course, does not claim to be a specialist in diagnosing the puzzling and deceptive symptoms of miners' phthisis, and it is not he but the system created by the Act that is at fault. Again, the adjudicating on victims of the disease is (under Section 28 of the Act) left to a panel of some thirteen busy, leading medical men of the Rand, who certainly do not pretend to be specialists in the disease. To two of them, with, in the case of disagreement, the right to call in a third, is entrusted the decision as whether the case is genuine, and if so, in which stage or category the victim falls. Now, if ever there was a case for highly specialized and centralized treatment, here we undoubtedly have one. Miners' phthisis and tuberculosis are known, in certain circumstances, to be almost indistinguishable. Yet the diagnosis is left to the hurried attention of some of the Rand's busiest doctors. The wonder, indeed, is that the number of irregularities is not much greater than it is. That instances do occur of men who have been compensated to the maximum extent for the worst form of phthisis being afterwards passed as fit to start work underground, is notorious. The evil can be traced back to the sinister influence of the Labour people with the Government. As we showed last week, it was the policy of concession to the Labour Party that induced Mr. Malan to register two votes (one as member of the Committee and a casting vote as Chairman) for Mr. Creswell's motion in the Select Committee on Miners' Phthisis on May 14th, 1912, adding a proviso to Section 16 of the Bill permitting the Miners' Phthisis Board to give compensation to men who have been less than two years on the Witwatersrand, which has done more than anything else to enable swindling by miners from Australia and elsewhere to be carried on under the Miners' Phthisis Act. It is also the same policy of concession to the Labour Party that has surrounded the doings of the Miners' Phthisis Board with a mystery and a secrecy which discredits the Board and encourages men to be dishonest. It is quite clear that what is wanted is the full light of publicity on the doings of the Miners' Phthisis Compensation Board. Surely it is not unreasonable to ask that the names of those who have been benefited under the Act should be issued to the Press. It is no more than is done by other departments of State, as, for instance, in the case of the Pension List, where the beneficiaries draw upon the public purse. The total sum distributed by the Phthisis Board must by now run into seven figures, and it is contrary to all precedent and equity that the allocation of this vast sum should remain wrapt in mystery. We shall be very much surprised if the Select Committee on the Miners' Phthisis Act does not have something very straight and clear to say about these features and phases of the machinery and administration of the measure.

Coal Contracts.

Last year we called attention to a paragraph in the fourth Report of the Select Committee on Public Accounts, in which a reference was made to the extra cost of £15,000 a year incurred through the purchase of coal from the Indwe Collieries. The Committee expressed the opinion that the Administration was not justified in incurring this large expense. The matter is discussed at some length in the Report of the Railway Board, which was issued this week. The Board agrees with the Public Accounts Committee "that the extra charge is not one that should be borne by the Railway Administration," but the Government, we are told, "has instructed that a contract be given to the company for the present year, because to refrain from taking coal from the collieries would result in the closing down of the mines, with the consequent hardship that would be inflicted thereby on the inhabitants of Indwe, since the township, which was built by the company in 1896, is largely dependent for its existence on the working of the mines." Further on we read that a contract has been entered into with the company, not only "for the present year," but for three years, for the supply of 10,000 tons a year at 11s. 6d. per ton, on the understanding that at the expiration of that period no further coal will be purchased from the colliery, "except at a price which will pay the Administration to use it." Whether the loss is debited to the railways or to the Treasury, transactions of this kind seem to us to be quite indefensible. It is no business of the Government to keep the Indwe Colliery, as the *Cape Times* very rightly points out, open at the expense of the taxpayer. The Municipality of Boksburg might as reasonably have asked for a State subsidy to the Cinderella Deep in order to prevent its closing down as it did last year, to the great detriment of the dwellers in that township.

THE MINERS' UNION MAKES A "DEAD SET" ON RANDFONTEIN.

Adoption of Western Federation of Miners' American Methods by Rand Labour Organizers—Concentration of Efforts on Individual Mines—Randfontein First Singled Out for Attention.

TROUBLE has arisen at Randfontein between the management and the men over certain disputed questions. The fact is not surprising to anyone who has followed the methods of the Miners' Association or the Mine Workers' Union of late. To our mind it is symptomatic of the new plan of campaign lately adopted by the organizers of that Union. A little while ago it was announced that at a meeting of the organizers of the Mine Workers' Union it had been decided to adopt the campaigning methods of that ill-omened American body known as the Western Federation of Miners. The sinister record of the Western Federation of Miners is a matter of history; and the recent conduct by it of the big strike of copper miners in Michigan has not improved its record. One of its characteristic devices is to concentrate its undivided attention on a single mining property at a time; and to relax no effort and stop at nothing till it has captured the whole mine for its purpose and adherents. That something of this sort is afoot at Randfontein is plainly discernible. The evolution of the attack can easily be traced back to its inception by the combined organizers some weeks ago. Under cover of heavy artillery in the shape of a cannonade of criticism against "victimization," several well-known agitators descended upon Randfontein, and courted a refusal of employment in order to make out a case. Then a quarrel was picked on various grounds; and the whole strength of the Union organization moved out upon Randfontein, making a demonstration in force. The end of the trouble is not yet, though in the statement by the Secretary of the company printed below there is no shadow of any further impending danger.

THE WESTERN FEDERATION RECORD.

The doings of the Western Federation of Miners in Michigan recently are not such as to commend themselves to any friends of the Rand. Up to the appearance of the Federation on the scene, mining operations were carried on quietly in that district, and the industry was singularly free from strike troubles. At no time was any part of the district thoroughly unionized, and at no time during the history of the district did any mining company treat directly with any labour organization. At the same time, men have been employed by the various mining companies on surface, machinists, moulders, railway engineers, brakemen, and others, who belong to the various unions or labour organizations of their particular crafts. Up to the time of the recent strike men were not discriminated against because of their membership in the Western Federation of Miners or any other miners' union, and many men, undoubtedly, were at work in the district, underground, who belonged to the Western Federation of Miners. Since the strike, however, every one of the managers of the mining companies operating in the district, has announced that hereafter no member of the Western Federation will be employed, and each of the managers of the various companies has also stated to representatives of the Federal Department of Labour and the Governor of the State, that they will under no circumstances recognise in any manner that particular organization. When requested to give their reasons for this arbitrary attitude, the mining managers stated as their reason the record of the Western Federation, as they understood it, in other camps previous to the trouble in the Michigan district. They pointed out in particular the record of the Federation in the strike carried on by it in the Coeur D'Alene district in Idaho in 1894, and in the Cripple Creek and other mining districts of Colorado from 1894 to 1904, and took the stand that in their refusal to recognise or treat with the Federation they were justified by the fact, as stated by them, that every labour dispute in which the Western Federation had taken part, was accompanied by bloodshed and violence. And this is the organization which Labour Unions on the Rand are to be invited to follow and emulate!

THE TROUBLE AT RANDFONTEIN.

The clearest and most reliable account of the trouble at Randfontein was given on Thursday by the Secretary of the Randfontein Central, Mr. J. C. Pollock, who wrote to the Press as follows:—

> With a view to supplementing the necessarily incomplete, and in some respects slightly misleading, reports which appeared in the newspapers this morning on the subject of the representations made by certain of the men to the management yesterday, I am requested by my Board to outline the facts to you. Some of the employes of our No. 6, or Block A, section approached Mr. C. A. Ferguson, the general manager of this company, to ask for increased pay and other concessions. Mr. Ferguson at once promised to meet a duly-elected deputation, but refused to permit the deputation to be accompanied by any Trade Union officials. The meeting took place yesterday afternoon, and consisted entirely of men in the employ of the company. It passed off in the most amicable manner, and reflected great credit on the reasonableness and commonsense of those in attendance. On the first point, that of increasing the pay of hand-stopers from 16s. 8d. to £1 per day, Mr. Ferguson agreed to go into the matter and to advance the men concerned by a grade if their length of service warranted it. It may be said that there are three grades of hand-stopers, those at 16s. 8d., at 18s. 4d., and at 20s. per day, so that the question is merely one of regrading those whose services to the company justify such a course. The second point raised was rather a technical one. It concerned the extra remuneration to be given to a ganger who was temporarily required to do the additional work of overseeing the natives of a neighbouring gang whose white boss had not turned up for some reason or other. It had been the custom on this section to pay an extra quarter-shift in this connection, and Mr. Ferguson agreed to the deputation's request that this additional work should be paid for as an extra half-shift, so that a man who gave some of his time to supervising a second gang, under the exceptional circumstances quoted, would receive fifty per cent. more pay for that shift. This concession merely brings Block A into line with the practice of the other sections of the company. There were circumstances peculiar to this section which justified the old arrangement, but it was thought better to ignore them, and to have a uniform rate throughout the property. With regard to the West Rand organiser of the Miners' Association visiting the change-houses and other buildings belonging to the company, Mr. Ferguson said he could on no account permit this, but could not prevent him from coming on the property with the exceptions mentioned. The matter of increased wages for trammers was next discussed, and the general manager said he was quite unable to consent to this point. On the subject of the size of hammer-boy gangs, Mr. Ferguson promised that the average number of hammer-boys in each gang should not exceed thirty. We may say that we cannot quite understand why this point should have been brought up, in view of the fact that the average size of such gangs on this section is but 22 to 23.

It remains to be seen what the sequel may be. At any rate, mine managers may draw their own conclusion from recent events on the West Rand. Their turn may come next.

The Native View

The following is an extract from the speech of Enoch Mamba in the Transkei Council or Bunga recently:—

> He said the present system was attended by grave abuses. Natives objected to being practically sold to the mines at so much a head, like pigs and goats, and disliked the whole system of middlemen and agents. Turning to labour conditions on the mines, he said that natives were prevented from making any advance, and however skilled they might become they were kept down as common drill hands. Skilled and educated men were not wanted, and the Council should not hesitate to let the Chamber of Mines know its opinion on the subject. Shareholders of mining companies were losing money by the rejection of skilled native labour, which could be obtained at a third of the cost of European labour. He referred to the insistence by the Government of Portuguese East Africa on a portion of the native wages being remitted to their own country, and he advocated a similar system for the Transkeian Territories in order to prevent labourers squandering their earnings on the Rand. Speaking of miners phthisis, he said the doctors who examined native labourers under the Act were servants of the mining companies, and he questioned the propriety of this. It was believed that many natives had contracted the disease, but received no compensation, and were treated as if they had bronchitis or something of the kind. In conclusion, he referred to the position of natives under the Native Labour Act in case of European strikes, which position he declared to be most precarious.

FLOTATION OF THE FOLAKARA OIL FIELDS.

A Sakalava Subsidiary—Capital, £110,000.

We have received a copy of the prospectus of the Folakara Oil Fields Ltd., a concern which is a local aspirant for flotation with a nominal capital of £110,000, divided into 110,000 ordinary shares of one pound sterling each. This amount is to be allocated equally as to vendors and working capital, vendors taking 55,000 shares issued as fully paid, and working capital claiming the balance of 55,000. Of these 33,750 are now offered for subscription and 21,250 are to be held in reserve. Subscribers for working capital shares have the right to increase their original application by 25 per cent. up to June 30, 1916. The company is a subsidiary of the Sakalava Madagascar Proprietary Oil Fields, Ltd., and an imposing array of officials and representatives in Johannesburg, Bloemfontein, Paris, Madagascar, London and Natal figures on the initial page of the document now before us The prospectus states, *inter alia* :—

> The company is being formed to acquire oil prospecting rights over 18,750 acres of carefully selected petroliferous land on the well-known Folakara Anticline, known as Anticline "C," situate in the Betsiriry Valley, West Coast of Madagascar. The company proposes to drill on the Anticline to locate the oil reservoirs, as advised by Mons. D. Levat, in his official report to the French Minister of Colonies (published during the year 1912), and also in his special report to the Sakalava Madagascar Proprietary Oil Fields, Limited, in 1913. In his official report to the French Minister of Colonies and to the Governor-General of Madagascar, Mons. David Levat states, *inter alia* :—"The Folakara Anticline lies perceptibly in a north to south direction, *i.e.*, in parallel lines with the great cliff of Bemahara. It is the one nearest to this great cliff, and consequently possesses the greatest probable thickness of triassic petroliferous formation, it being at least 28 kilometres away from the Archean edge. This important fold stretches quite regularly over a length of more than 40 kilometres, frequently landmarked along the whole of this distance by outcrops consisting of pools and runnels of inspissated naphtha." There are seepages of oil on both flanks of the Anticline. One seepage is very large, and even during the dry season flows slowly but constantly at the foot of an impregnated coarse sandstone bank 20 feet high. The boring site selected is excellently placed, being situated on the banks of the Manambolomaty, thus assuring a plentiful supply of water all the year round, while on the opposite bank there is a forest of big trees, which will provide a good, cheap, and abundant fuel for the boilers. In concluding his report, Mons. Levat states, *inter alia* :—"I have no reason to change my opinion expressed in 1911 on the Folakara Anticline. It is very unfortunate for everybody it has not been drilled upon up to now. By its position and features this property is a very valuable one, and must be drilled with a powerful machine able to reach 3,000 feet in depth. This ground can be floated immediately into a subsidiary company." The Manamboa and Manambolo Rivers cross the Betsiriry Valley, and are navigable to within a few miles of the property, which is about 60 miles from the coast. This is an easy distance compared with other oil fields of the world.

Attached to the prospectus is a circular which, it is stated, "does not form part of the prospectus," entitled "The Reign of Oil," in which it is sought to prove that the world is entering upon an oil age in so far as marine propulsion, and particularly naval propulsion, is concerned.

PROGRESS OF MESSINA COPPER.

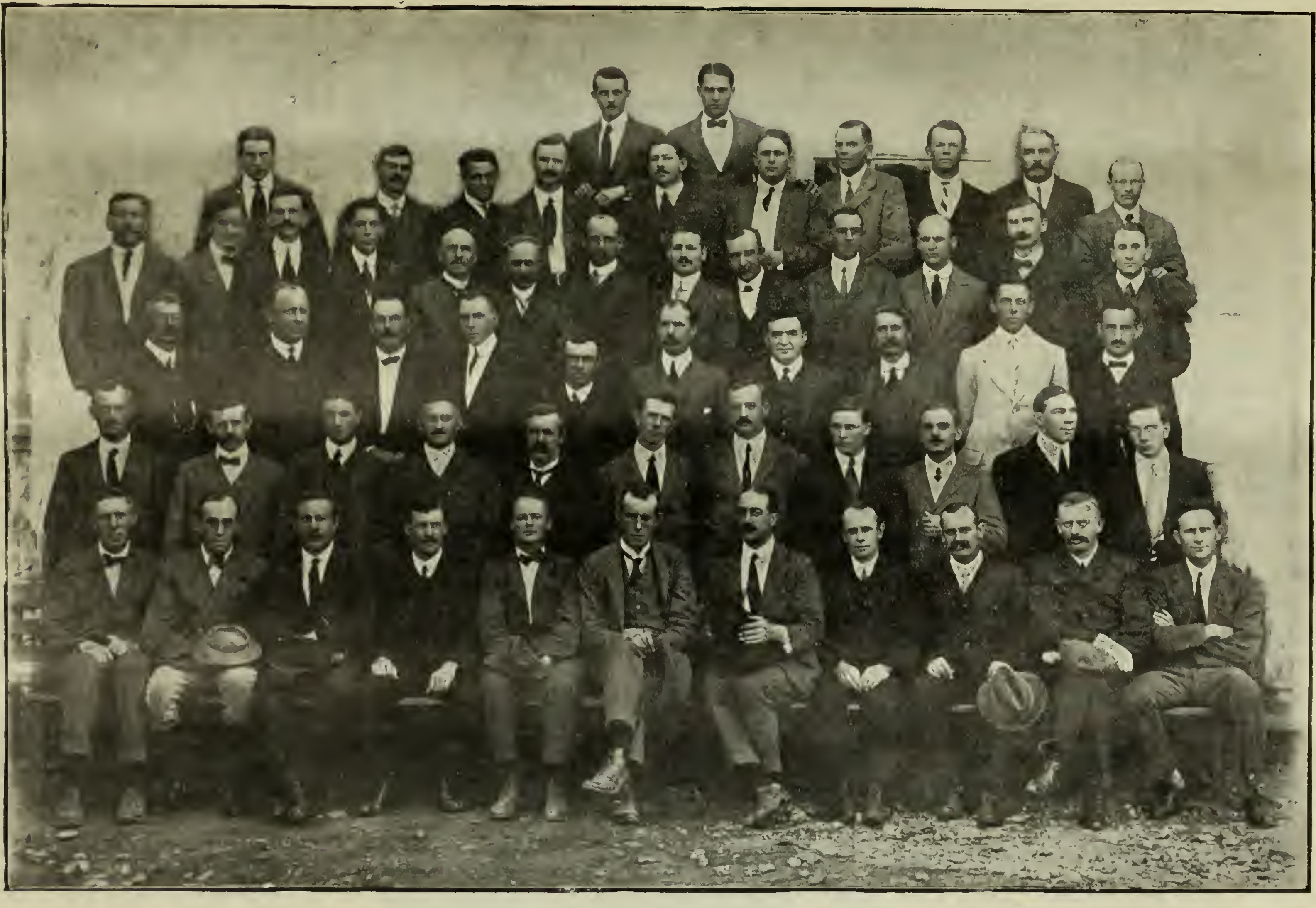
Position at the Mine—Mr. Frecheville Visiting the Property—Sinking No. 4 Shaft.

Development operations continue to proceed satisfactorily at Messina, and the monthly outputs and profits recently recorded have been notably good. As was anticipated in the columns of this journal a few months ago, the Messina property since the railway to the mine has been completed and the new smelter and concentration plants have got into full running order, has forged rapidly ahead and must now be accounted one of the really important productive ventures of South Africa. The Messina Company is the only productive copper concern in the Transvaal, and the outputs of the Province are therefore those of the Messina Mine. A glance at the statistics as to the production of Transvaal copper during recent years published by the Union Department of Mines thus indicates how substatially the outputs of Messina have advanced recently. The Government Department of Mines' statistics show the progressive totals of sales and shipments in the Transvaal to be as under for the past three years:—1911, 2,079 tons, value £48,237; 1912, 1,619 tons, value £49,142; 1913, 5,289 tons, value £138,328. For the first months of the current year a still greater advance is shown: January, 1914, 907 tons, value £23,413; February, 1914, 1,494 tons, value £35,016; March, 1,645 tons, value £40,025. As to the profit-earning capabilities of the mine, we understand that an earning of about £17,000 per month is being secured, which, on the capital in issue of the company, £165,451, should admit of the payment of substantial dividends in the not far distant future. Underground the mine continues to open up well. The No. 5 shaft has been sunk to the 10th level, a depth of 1,000 ft. The No. 4 shaft, which is a twin vertical of No. 5, is now also being sunk to the tenth level, and when this has reached the same depth as its sister shaft, the No. 5 will be sunk deeper with a view to probing up the lenticular ore bodies at still greater depth. The question of water supply, which has occasioned the management some anxiety, was solved some little time ago by a very heavy rainfall, and there is now abundant water in the Zand River, from which the company derives its water supply. The mine is now being visited by Mr. J. M. Calderwood, the company's consulting engineer, who is accompanied by Mr. R. J. Frecheville, the well-known English mining engineer. Mr. Perkins, another copper smelting expert, is also proceeding to the mine very shortly in company with Mr. Charles Stuart, the local representative of the company in Johannesburg.

Main Reef West.

Expenditure and revenue for the quarter ended 31st March, 1914, was as follows :—Expenditure (calculated on the basis of the tonnage milled), £59,147 2s. 11d.; profit for quarter, £13,447 16s.; revenue, £72,594 18s. 11d. *Note.*—No allowance has been made in the above statement for interest on debentures, or for the Government tax on profits. The capital expenditure was as follows :—Shafts, £2,873 1s. 5d.; buildings, machinery and plant, £47 13s. 0d.; total, £2,920 14s. 5d. *Milling.*—Stamps running, 83.52; time run, 80.59 days; three tube mills ran 72.61 days; tons crushed, 52,440; duty per stamp per day, 7.638 tons; yield in fine gold, 13,009.018 ozs.; yield in fine gold per ton crushed, 4.962 dwts. *Cyaniding (sands and slimes).*—Sands treated, 28,110 tons; slimes treated, 21,330 tons; yield in fine gold, 4,313.919 ozs.; yield in fine gold per ton crushed, 1.645 dwts.; cost per ton treated, 1s. 8.682d.; recovered from all sources employed per ton milled (fine gold), 6.607 dwts. *Development.*—Drives and crosscuts, 1,726 ft.; raises and winzes, 1,051½ ft.; main crosscuts, 23½ ft.; other crosscuts, 106½ ft.; ore passes, 6 ft.; No. 4 shaft sinking, 123 ft.; total, 3,036½ ft. *Assay Values.*—Excluding main crosscuts, ore passes and shaft sinking, 2,244½ feet, or 80.8 per cent., has been on reef. Of this 832 feet, or 37.1 per cent., has been payable of an average value of 7.3 dwts. over 48 inches; and 1,412½ feet, or 62.9 per cent., has been unpayable of an average value of 3.7 dwts. over 48 inches. Of the payable portion, 733 feet, or 88.1 per cent., has been on Main Reef Leader, of an average value of 7.5 dwts. over 48 inches; and 99 feet, or 11.9 per cent., has been on South Reef, of an average value of 6.4 dwts. over 42 inches. *Ore Reserves.*—Ore reserves, 1st January, 1914, 529,250 tons; ore developed for quarter, 23,490 tons; less ore mined for quarter, 58,635 tons; less difference in stoping width, etc., 10,855 tons; ore reserves, 31st March, 1914, 504,960 tons. *Mining.*—Ore mined for the quarter, 58,635 tons; less waste sorted out (10.82%), 6,345 tons; less difference in bins, 150 tons; ore milled for the quarter, 52,440 tons.

THE MANAGER AND STAFF OF THE SIMMER & JACK PROPRIETARY MINES, LTD.



Bottom row (left to right): J. A. Taylor, cyanide manager; R. L. Hewston, mine captain No. 1 shaft; A. W. Scandrett, assistant secretary; W. S. Carr, resident engineer; F. G. Dunning, underground manager; O. P. Powell, manager; F. H. Down, resident secretary; R. Craib, assistant engineer; J. R. Cherry, mine captain No. 4 shaft; W. H. Stout, mill manager; J. Backman, head sampler.

Second row:—T. Harrison, white timekeeper; W. Wilson, outside foreman; I. Hind, apprentice draughtsman; J. Proctor, statistican; S. Smithson, foreman electrician; W. S. Grace, assistant storekeeper; L. C. Blundell, assistant sampler; M. Truhauf, assistant surveyor; B. Schaefer, assistant native timekeeper; J. S. Clark, assistant native timekeeper.

Third row:—A. J. Andrews, coal and magazine clerk; C. H. Lloyd, assistant storekeeper; R. Fairbairn, O.C. mine police; W. R. Tait, head surveyor; H. Macalman assistant storekeeper; W. G. Harger, mill foreman; P. L. Sansom, assistant native timekeeper; H. Hammer, assistant sampler; J. A. McInnes, assistant storekeeper.

Fourth row:—J. Murray, cyanide shift boss; G. H. Royse, shift boss; A. A. Heaton, workshops clerk; L. B. Cowin, native hospital superintendent; T Wood, foreman carpenter; J. W. Marshall, foreman boiler maker; E. A. Powell, o/c transport; W. E. Watson, mill shift boss; T. Hampton, foreman blacksmith; A. S. Cotterell, storekeeper; R. R. Hughes, foreman fitter; J. McCririck, assistant surveyor; E. Grimbeck, shift boss.

Fifth row:—C. P Watson, shift boss; W. G. Pullock, foreman pumpman; J. Sherman, foreman rock-drill fitter; J. J. le Roux, assistant compound manager; C. C Hobson, native timekeeper; C. M. Botha, mine captain No. 2 shaft; G. F. Brissenden, compound storekeeper; E. M. Tucker, mine clerk; L. Richmond, caretaker; C. Greathead, mine captain No. 3 shaft.

Back row:—C. E. Cumming, assistant sampler; F. A. C. Backmann, assistant sampler.

Olliver, Photo

SOUTH AFRICAN SURVEY PRACTICE.

A Tribute to the Excellence of Rand Methods—Universal Form of Records Urged.

It has always been recognised that in the mines of South Africa surveying practice has attained to a high standard of excellence. Some of the connections effected between deep level shafts and drives, notably in the cases of the Cinderella, Brakpan and Springs Mines properties, have often been cited in support of the contention that South African mine survey practice is at least as advanced and accurate as in other mining countries. In a recent bulletin of the Institution of Mining and Metallurgy this aspect of Rand technique is discussed by Messrs. C. G. Priest and W. Whyte, who pay high tributes to the Survey staffs of the Witwatersrand. In the course of a paper entitled " Notes on Mine Survey Records and Calculations," they state:—

> In view of the high standard of surveying generally obtaining in South Africa, it would seem only right to accord special consideration to the methods used in that country in a discussion such as the present. The writers have accordingly taken examples of South African practice to form the basis of comparison in the present notes. At the outset it will be as well to consider some of the conditions which differentiate survey practice in South Africa from that elsewhere. The comparatively regular and continuous nature of the banket reefs on the Rand probably enables more accurate work to be done than could be accomplished without considerably more trouble and expense in many of the base metal mines. It certainly makes possible, and should conduce to, more uniformity in methods of surveying. The contiguity of a large number of mines in a comparatively limited area, should also tend towards this. In many base metal mines where the margin of profit is smaller than on the large gold mines, the question of expense is one which may have a great influence on the survey department. Inferior, or out of date, instruments are provided, surveying being done in the spare time of a shiftboss or other official who possibly has not but limited experience, and no stipulations being made as to methods or checks. Or again, perhaps the nature of the mine working is such as to necessitate the use of the magnetic needle. Compared with such variations of general conditions, it is, perhaps, hardly surprising that Rand practice should stand on a footing of its own, where, in a general way, it suffers under none of these disabilities. The fact that a reef, or a series of reefs, goes continuously right through several properties only distinguished the one from the other by arbitrary boundaries, soon brought the legal aspect very much to the fore, and as a natural result Government regulations have been formed progressively, until now there is scarcely a feature of mine-surveying in South Africa which is not under legal control. This has, no doubt, also contributed largely to the pre-eminence of surveying there. Notwithstanding that the degree of accuracy demanded may appear excessive to those in certain other parts of the world who are under no such legal obligations, the adoption of some of the methods and safeguards against the introduction of errors would be productive of only good results, as well as tending to a conformity of practice. It should not, however, be inferred from the above remarks that the methods of calculating and recording surveys on the various South African mines are identical. This is far from being the case, and, however excellent the various methods may be individually, they suffer from a striking lack of uniformity. Scarcely two offices will be found to employ exactly the same methods, which seems the more remarkable when we consider the slight differences in general conditions prevailing. No doubt this is, as before suggested, due to lack of co-operation between surveyors. Perhaps the most salient features in which S.A. practice differs from that in other parts are (a) the adoption of due west as origin, or zero point, instead of due north, as is usual elsewhere; and (b) the adoption of a datum 6,000 ft. above sea-level, instead of sea-level, all levels being stated below datum instead of some above and some below. These variations, although fundamental, in no way influence methods in either field or office work other than the obvious mathematical differences in calculations involved. It will be noticed in the examples of South African practice the ' y ' co-ordinates are placed in the first column, whilst when north is used as origin the ' x ' co-ordinates occupy the first column. Thus in both systems the N. and S. axis and the E. and W. axis occupy the same relative positions. Mention might here be made of the method of calculating the bearings. In all the examples the ' whole circle ' method (' continuous bearing method ') of calculating is adoption, and is fairly general in South Africa. There are, no doubt, many who prefer the quadrant method, especially where surveying is done by magnetic needle. In the present notes, however, only theodolite surveying is dealt with. . . . . Perhaps the authors are seeking unattainable ideals in hoping for a universal form of records, but the paper will have served part of its purpose and done a useful service if it impresses on those mine surveyors (is it too much to hope managers also?) who read it, that they should take into consideration the requirements of the future as well as those of the immediate present. A realization of this would go a long way towards the improvement of records. The chief points in suitable recording may be summarised:—
>
> 1. Permanence—necessitating good paper, ink, and durable survey points.
> 2. Adaptability—to cope with the ever-varying state of the mine and the survey staff.
> 3. Detail—to enable successors to judge the accuracy and care bestowed, and obtain full benefit of the work done. The brain of the observer serves but indifferently as a record file.
> 4. Clearness—to allow of ready reference by others than the computer.
> 5. Accuracy and Reliability—to obviate repetition work, and only attainable by the liberal use of checks and avoidance of copying.
> 6. Convenience—allowing ease of handling and ready plotting, eliminating ' dead ' matter from current work, and necessitating moderate dimensions and light clean covers of all records.
>
> In the foregoing notes only the co-ordinate method of mine-surveying has received attention, but as this method is now generally recognised as the best practice in modern metalliferous mine-surveying, it was considered scarcely necessary to deal with other methods in relation to records and calculations, since being simpler the latter naturally require less systematic classification. Nevertheless, it is hoped that some of the suggestions will prove applicable in other classes of surveying.

Mine Accident Statistics.

In comparing the mine accident statistics of the Rand with those of America, it has been pointed out that the greatest care must be exercised, in view of the different systems of computation followed. Confirmation of this is afforded by the following criticism of the United States accident statistics published by the Bureau of Mines, taken from the *Engineering and Mining Journal*, of New York:—" The accuracy of accident and death figures published by the Bureau is still far from what it should be," says that paper. " Not only must the 300,000 man-shift basis be adopted, but greater uniformity is necessary in ascertaining the number of men employed. This number should be the daily average at work, not the pay-roll average. If the operator could be induced to report the number of individual days wages paid, the exact number of man-shifts would then be had at once. Furthermore, a better criterion of the risk existing and the degree of safety obtained should be had. It it usual now to use the death rates in comparing year with year, or district with district, and this is the best criterion available. It is far from ideal, however. Certain injuries are more serious than a death. A man losing two members, or both eyes, not only usually leaves his family without support, but becomes himself a drain on the community. A better criterion would be had by combining all deaths and other injuries into one figure, each weighted according to its seriousness. Other questions require clarification. What constitutes a death in the statistical classification? Suppose a man dies from an injury after a year or more, is it to be classed as a death or an injury, and if a death, to what year is it to be assigned? Suppose a man dies from blood poisoning following a cut of minor importance? The division of accidents into slight and serious has always been everywhere both arbitrary and vague. Division on the basis of incapacity lasting more than a week, or two or three, is far from satisfactory. More detailed classification is desirable. The most serious accidents, as stated, are more serious than deaths. The Bureau of Mines is more competent than any body else to introduce these reforms into the handling of mine accident statistics and could do no more useful work. It is a pleasure to record that this report shows that the U.S.A. "safety first" campaign is at last bearing fruit. The death rate for 1911 in the metal mines of this country was 4·45, reduced to the 300-day basis; in 1912 it was 4·09. Figured on the same basis, the coal-mine rate for 1911 was 5·09, and for 1912 4·36. Substantial gains like these are gratifying, but how far we have yet to go before attaining the figure of 1·5 to 2, which prevails in Australasia!"

New Heriot.

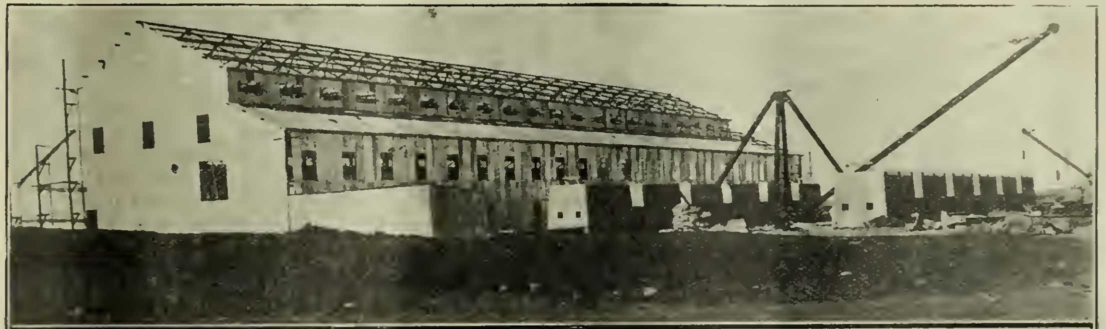
Tons milled, 12,900; ounces recovered, 5,522; profit, £9,582.

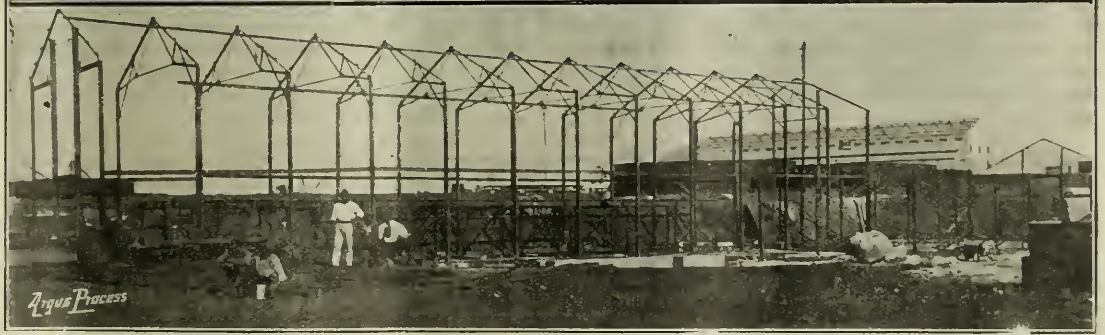
MODDER GOVERNMENT AREAS.

Progress of Construction Work—The Economy of Modern Plants—Satisfactory Developments in the Past Quarter.

The extensive scale upon which development and constructional operations are now proceeding at the Government Gold Mining Areas (Modderfontein) Consolidated property may in some measure be judged from the fact that during the quarter ended with March last the total capital expenditure incurred was £101,642. During this period the new 50 drill Fraser & Chalmers' compressor was completed, as also were the extensions of the main workshops. As to the reduction plant, good progress was made with foundations and erection of tanks, etc. Since the end of March work has further advanced, and the two photos accompanying this article give one a very good idea of the position in regard to equipment at the present time.

Tube Mill House and Mortar Blocks for Mill.





Butters Filter House Tanks and Tube Mill House in Background.

Position To-day.

The first photo shows the tube mill house with the galvanised iron walls completed and a portion of the roofing finished. This structure will contain ten 16 ft. 6 in. by 6 ft. tube mills, that is to say, one tube mill to each battery of ten stamps, as at the Van Ryn Deep and Consolidated Langlaagte. Amalgamation will take place after the coarser ore has passed through the tube mills and the pulp will then be separated into sand and slime for cyanide treatment. In the foreground of this photo will be perceived the mill foundations with the mortar blocks in place. Work is now proceeding in connection with the installation of the stamps. These will number 100, and each will be of 2,000 lbs. falling weight, the capacity being 50,000 tons per month.

The Metallurgical Scheme in Brief.

The other photograph exhibits the steel framing of the Butters' filter house, with some of the cyanide tanks and the tube mill house in the background. The sand plant will have three collectors of 56 feet diameter, each capable of holding 740 tons of sand. The sand from the collectors will be conveyed by belts and delivered by a Blaisdell distributor into the treatment tanks. There will be eight treatment tanks of 56 feet diameter, each capable of holding 740 tons of sand. The slime plant will consist of six collectors, each 70 feet diameter and 10 ft. 6 in. high, including the cone bottom; nine air agitating tanks, 45 feet high and 15 feet diameter; and the Butters filter plant. Precipitation will be in the usual divided boxes filled with zinc shavings. It will be noted that the general design of the plant is on similar lines to that of the Van Ryn Deep and Consolidated Langlaagte, only the probability of considerable additions in the future has been kept in view throughout, and this has caused modification of many details. For instance, the Government Areas mill is being constructed on the back-to-back principle with a view to almost indefinite extension in the future. It is expected that the plant will be ready towards the end of this year.

Duty and Costs.

The duty obtained by the Van Ryn Deep plant in the quarter ended with March last was practically 22 tons per stamp per diem, and it can be confidently expected that a duty at least as high will be secured by the Government Areas battery, whilst the satisfactory extraction figures shown by the Van Ryn Deep will also be duplicated at Modderfontein. As to metallurgical costs, the good results shown by the Van Ryn Deep and Consolidated Langlaagte mines with their new mills should be at least equalled by the Government Areas, where the capacity will be higher than at either of those two plants. The favourable influence of the "last words" in mill and cyanide construction on working expenditure is well instanced in the following table, which shows the milling and cyaniding costs of the Barnato subsidiaries in the quarter ended with March last:—

Mine.	Plant.		Tons Crushed.	Milling Costs.	Cyaniding Costs.	Total Metallurgical Costs
	Stamps	Tube Mills		s.	s.	s.
Cons. Langlaagte	100	10	121,500	2·093	1·186	3·279
Ginsberg	80	1	43.350	3·144	1·961	5·105
Glencairn	160	—	60.098	2·264	1·848	4·112
New Primrose ...	160	2	70,400	2·355	1,550	3·905
New Rietfontein	110	—	31,783	2·792	2·043	4·835
New Unified ..	60	1	37,200	2·737	1·461	4·198
Van Ryn Deep ..	80	8	103.740	2·241	1·384	3·625
Witwatersrand ..	225	5	119.660	2·619	1·499	4,118

DEVELOPMENT.

It will be observed from the above that the Consolidated Langlaagte and Van Ryn Deep easily show the lowest reduction and cyaniding costs of the group, with 3·279s. and 3·625s. per ton milled, respectively, and since the Modder Government Areas equipment is to be of like design, but greater capacity, a similarly excellent showing above ground can safely be anticipated for the State Mines. Interesting as are questions relating to equipment, the state and progress of underground development is manifestly much more important. The Modder Areas is an enormous property—one of the very largest on the Witwatersrand—and the width and value of the reef disclosed in the 2,633 claims of the company is a matter of the greatest moment, not only to this company but to the Rand as a whole, and particularly the Further East Rand. Taken on the whole, the results secured must be considered satisfactory. As in other sections of the Far Eastern Rand, the ore is of somewhat erratic value, and rich patches and poor patches mingle together. However, over half a million tons of payable ore were developed in the northern section of the mine last year, the average value of this development being 6·6 dwts. over a stoping width of 50 ins. Since the end of the year and up to March 31st last development work as follows was achieved:—North-East Shaft: The total footage driven, risen and sunk during the quarter was 2,713 feet, of which 902 feet were in main haulages, crosscuts and other points not on reef. Of the footage sampled, 880 feet were on payable reef, averaging 28·1 inches width and 12·8 dwts. value; 720 feet were on unpayable reef, averaging 22·5 inches width and 2·9 dwts. value, and 200 feet were on reef partly exposed, averaging 62·0 inches width and 0·9 dwt. value. North-West Shaft: The total footage driven, risen and sunk during the quarter was 2,815 feet, of which 1,175 feet were in main haulages, crosscuts and other points not on reef. Of the footage sampled, 1,280 feet were on payable reef, averaging 33·8 inches width and 10.8 dwts. value; 130 feet were on unpayable reef, averaging 15·0 inches width and 1·6 dwts. value, and 190 were on reef partly exposed, averaging 22·5 inches width and 2·5 dwts. value. South-East Shaft: The total footage driven, risen and sunk during the quarter was 2,159 feet, of which 930 feet were in main haulages, crosscuts and other points not on reef. Of the footage sampled, 950 feet were on payable reef, averaging 42·8 inches width and 9·5 dwts. value; 120 feet were on unpayable reef, averaging 37·0 inches width and 1·1 dwts. value, and 150 feet were on reef partly exposed, averaging 27·0 inches width and 2·8 dwts. value. South-West Shaft: The total footage driven, risen and sunk during the quarter was 1,237 feet, of which 803 feet were in main haulages, crosscuts and other points not on reef. Of the footage sampled, 420 feet were on payable reef, averaging 23·9 inches width and 18.4 dwts. value; unpayable footage, nil. This is certainly a satisfactory statement and comparison of development results in the March quarter with those secured in the year 1913 shows that results have recently improved materially. The good disclosures in the southern shafts are particularly noteworthy. The values and widths disclosed to date should yield a very fair margin of profit when the mine is operating a milling equipment commensurate with the big potentialities of this company.

Knight Central.

Expenditure and revenue for the three months ended 31st March, 1914, was as follows:—Expenditure (calculated on the basis of the tonnage milled), £63,470 7s. 3d.; profit for the quarter, £13,705 11s. 11d.; revenue, £77,175 19s. 2d. *Note.*—No allowance has been made in the above statement for the Government tax on profits. Capital expenditure for quarter was as follows:—Shafts, £5,302 10s. 6d.; buildings, machinery and plant, etc., £3.254 10s. 2d.; total, £8,557 0s. 8d. *Milling.*—Average number of stamps running, 98.38; time run, 74.02 days; three tube mills ran 70.14 days; tons crushed, 66,150 tons; duty per stamp per day, 9.13 tons; yield in fine gold, 13,329.177 ozs.; yield per ton crushed in fine gold, 4.01 dwts. *Cyaniding (sands and slimes).*—Sands treated, 39,587 tons; slimes treated, 26,550 tons; total, 66,137 tons. Yield in fine gold, 5.069.232 ozs.; cost per ton crushed, 1s. 5.10d.; yield per ton crushed, 1.53 dwts.; yield per ton treated, 1.53 dwts.; recovered from all sources employed per ton milled (fine gold), 5.54 dwts. *Mining.*—Ore in bins, 1st January, 1914, 500 tons; ore mined and from dump, 68.367 tons; less waste sorted out, 3.21 per cent., 2.192 tons; tons crushed, 66.450 tons; ore in bins 1st April, 1914, 225 tons. *Shaft Sinking and Stations.*—The east shaft has been sunk 17 feet to a total depth of 4,619 feet and timbered 20 feet to 4,518 feet. A chamber is being cut on the 15th level to accommodate the electric winders for the subsidiary shaft. A triplex pump capable of pumping 12,000 gallons per hour has been added to the equipment of No. 4 pumping station. The west shaft has been sunk 132½ feet to a total depth of 4,793½ feet, or to about 33 feet below where the 16th level crosscut will be commenced, and timbered 120 feet to 4,610 feet. *Development.*—Driving and crosscutting, 1,345 feet; main crosscutting, 55 feet; raising and winzing, 240½ feet; ore passes, 12 feet; prospecting work, 128½ feet; total, 1,781 feet. *Reef Values.*—Exclusive of main crosscuts, ore passes and prospecting work, 1,188½ feet, or 75.0 per cent., of the development work has been on reef. Altogether, 1,175 feet have been sampled. This comprises 415 feet, or 35.3 per cent., averaging 7.4 dwts. over an estimated stoping width of 62 inches, and 760 feet, or 64.7 per cent., averaging 2.0 dwts. over 54 inches. Reef South of Dyke: Of the footage sampled during the quarter, 720 feet is from south of the Simmer Dyke. This includes payable patches totalling 195 feet averaging 7.1 dwts. over an estimated stoping width of 61 inches. The remaining 525 feet averaged 1.9 dwts. over 57 inches. The workable stretches so far exposed now amount to about 32 per cent. of the total footage sampled, and give an average value of 5.3 dwts. over an estimated stoping width of 48 inches. *Ore Reserves.*—Payable ore exposed as at December 31st, 1913, 539,100 tons at 6.0 dwts. over 60 inches; payable ore exposed or developed during quarter ended March 31st, 1914, 37,300 tons at 6.4 dwts. over 62 inches; total, 576.400 tons at 6.0 dwts. over 60 inches. Less ore mined from payable blocks during quarter ended March 31st, 1914, 58,200 tons. Total ore reserves at March 31st, 1914, 518,200 tons at 6.0 dwts. over 60 inches. Pending further information, no ore south of the Simmer Dyke has been included in the above estimates.

Mount Anderson "Rush."

Reuter's agent, in an interview with a prospector and digger at present visiting Pilgrims Rest from Mount Anderson, learned that many persons are coming to the mountain with only an equipment of pick, shovel, and a couple of blankets. Some have walked all the way from the Rand, and arrive without funds. There is nothing for them to do, and, not possessing claim licences or money to pay for them, there is no chance of obtaining ground, were there any promising places available. All good ground where good finds have been made in the neighbourhood of Donovan's and Hope's claims, have been pegged, and there are many persons who have taken out licences yet unable to put a peg in. Other parts of the mountain open have to be proved, and while it is a small man's proposition, it is certainly not a poor man's.

POSITION OF THE EAST RAND PROPRIETARY MINES.

Profit Outlook for the Current Year—Substantial Revenue from Slime Treatment—Exploitation of the Deeper Levels.

At the annual meeting of the East Rand Proprietary Mines, held about a month ago, Sir George Farrar, who presided, prepared shareholders for some diminution in the rate of profit earning during the current year. In the course of his speech, Sir George remarked:—"The board in its report directs your attention to the paramount importance of increasing the scale of development operations, but to achieve this we are being greatly hampered by the scarcity of natives, and we have been compelled to transfer a considerable proportion of our best labour, from stoping to development. Should, therefore, the supply not materially improve I cannot see that the last year's rate of profits will be maintained. This was foreshadowed in the superintending engineer's report. It is somewhat early in the year to prognosticate, but I am afraid that shareholders during the current year must be prepared to accept a lower rate of dividend." Sir George's candid prophecy seems likely to be fulfilled more quickly than have most other prognostications regarding the East Rand Proprietary Mines.

This Year's Earnings.

The total profit earned by this company last year was just over one million sterling—to be precise, £1,013,145. This sum included £47,868 derived from the treatment of accumulated slime. For the first four months of this year the returns secured by the company have been as follows:—

Month.	Stamps	Tons Milled.	Output.	Profit.	Value recovered from Accumulations
January	820	123,500	£190,511	£47,074	£4 634
February	820	125,000	189,208	50,292	9,342
March	820	137,100	210,131	51,960	9,528
April	820	140,000	211,117	63,983	9,009

The total profit secured for the first four months of this year has thus been £213,309. If this rate is not improved on before 1914 comes to a close the total earning for the year will thus be in the neighbourhood of £640,000, or, say, only 60 per cent. of the 1913 total. It must, of course, be admitted that the labour troubles of January affected that month's operations, whilst the effect was doubtless also extended to the February and March results. Last month's profit at £63,983 was very much better. Assuming, however, that this rate of earning can be maintained for the rest of the year, it will be clear that the profit for 1914 will still be much below that recorded in respect of 1913.

The Slime Asset.

It should be noted, too, that the output each month receives a substantial contribution from the treatment of accumulated slime. The profit derived from this source during 1913 was £47,869; for the past month or two accumulated slime treatment has given the company a monthly profit of between £7,000 and £8,000. The company possesses no inexhaustible quantity of accumulated slime—we cannot find any reference in the annual report to the amount remaining at the end of last year—and the cessation or diminution of revenue from this asset would presumably further diminish profits. Unquestionably the great need of the East Rand Proprietary at the present is a thoroughly adequate supply of native labour sufficient not only to maintain the present rate of productive operations but sufficient also to push forward development and carry out the scheme of underground development in the lower levels, on which so much insistence is laid down in the annual technical reports. On these important points Mr. Ross Skinner wrote:—"It is of paramount importance in view of the shortage in the ore reserve, that development operations should be increased to the maximum as early as possible, even if such a policy should result in a temporary diminution in the tonnage milled." Mr. W. T. Anderson wrote:—"The scheme for the general layout of the deeper levels of this property, mentioned in the last annual report, has been proceeded with as far as the native labour supply allowed, but the progress made was far short of that anticipated. Provided an adequate supply of native labour be obtainable, the headway during the coming year will result in the completion of a large portion of the scheme."

The Deeper Levels.

In regard to these projects, we understand that steady progress, in spite of great and complicated difficulties, has been made. The Hercules and Angelo Deep sections are being opened up with a view to connecting them with the outcrop sections. In the Angelo Deep, on the 27th level west, everything is in readiness to cope with a flow of up to three million gallons of water daily. The rush may come at any time, with the penetration of the notorious Wit. Deep water dyke. Unique preparations have been made to cope with it. One feature is a dam of enormous strength, pierced by an aperture, which is guarded on the side whence the rush is expected to come, by a forged steel door, which can be closed at a moment's notice. This door will safeguard the lower levels against flooding in the event of the pumps temporarily stopping from any cause, or in the event of a sudden rush of unexpected volume. To pump three million gallons of water daily against a head of four thousand feet surpasses, we believe, anything previously attempted in mining engineering on these fields. It should be mentioned, too, as showing the magnitude of the deep level operations of the company, that the electric winding engine which is being installed at the Hercules shaft will be capable of hoisting in one trip a nett load of eight tons from a depth of 4,500 feet.

What the Government Draws in Claim Licences.

In the House of Assembly on Tuesday Mr. Nathan (Von Brandis) asked the Minister of Finance: (1) How much was paid in the form of claim licences to the various Governments in the Transvaal during the periods (a) from 1886 to May 31, 1901; (b) from June 1, 1901, to April 30, 1914; (2) how much of these moneys had been paid to the owners of farms? In reply, the Minister stated that in the first period named the amount paid to the Government was £2,650,000, and to owners of farms £1,617,000. From June 1, 1901, to April 30, 1914, the amount paid to the Government was £2,719,000, and to owners of farms £1,905,000. Regarding the second part of the question, the Minister said figures for the period July, 1899, to July, 1901, were not at the moment available.

Nigel G.M. Co.

The returns from this company's mine for the month of April are as follows:—Gold, 4,692 fine ozs.; profit, £3,360; stamps working, 75; tons milled, 12,700. No rain has fallen yet.

Langlaagte Estate.

Report for quarter ended March 31. Revenue, £168,572 9s. 6d., or £1 4s. 2d. per ton, from 139,273 tons milled; cost, £128,095 13s. 6d., or 18s. 4d. per ton;. profit, £40,476 16s., or 5s. 9d. per ton; yield mill 19,192 ozs., cyanide 20,686 ozs.; total yield, £39.879 ozs.; capital expenditure, £4,069 19s.; development, 3.108 linear and 4.000 cubic feet; ore reserves, 1.526.285 tons. The machinery and plant are in good order. The water supply is sufficient. Although the native labour position improved towards the end of the quarter, the mine is still short of requirements. The general strike in January caused a 2½ days' stoppage of the mill and subsequent disorganisation.

TIN AND COPPER PRICES.

South Africa and the Metal Markets—Transvaal's Base Metal Production Since Union, £1,862,000.

THE Transvaal up until seven or eight years ago was a country the mineral wealth of which was supposed to be confined entirely to gold, diamonds and coal. The development of the Messina Copper mine and the various tin properties in the Waterberg district has, however, brought the Transvaal into the arena of the metal markets. Whether in the years to come a successful iron and steel industry will be established in South Africa, we do not here propose discussing. The material is undoubtedly at hand, but there is great variance of opinion as to its purity and the various economic factors that would have to be most carefully investigated before serious attempts were made to inaugurate a large enterprise. But whatever the future may hold for iron and steel in the Transvaal, the fact remains that this country by virtue of its important outputs of tin and copper ores has become vitally interested in the Rialto of the metal markets, and it is an indication of the extent to which industry in regard to the winning of these valuable metals has been stimulated that we are constantly being asked for information bearing on the prices obtaining for tin and copper and also for other metals. It may not be generally appreciated that since the commencement of Government under the Union Parliament in the middle of 1910 the sales and shipments of tin and copper ores from the Transvaal have reached the large aggregate value of £1,861,854, tin accounting for £1,489,319 and copper £372,535. Progressive totals up to the end of March last have been as follows:—

COPPER.

June to December, 1910	£38,375
Year 1911	48,237
Year 1912	49,142
Year 1913	138,328
January, 1914	23,412
February, 1914	35,016
March, 1914	40,025
Total	£372,535

TIN.

June to December, 1910	£175,748
Year 1911	410,848
Year 1912	367,699
Year 1913	427,863
January, 1914	38,613
February, 1914	34,056
March, 1914	34,492
Total	£1,489,319

Since this country is now selling and shipping tin and copper ores at the rate of about £900,000 in value per annum, it can be calculated without difficulty that by the end of this year the aggregate value of tin and copper production will in all likelihood have reached the very substantial aggregate total of well over two and a half millions. At the time of going to press tin is quoted at £153 5s., and copper £63 2s. 6d. per ton. For the following valuable statistics concerning the metal markets, we are indebted to Messrs. Parry, Leon & Co., of this town, who have forwarded us a report from Messrs. Henry R. Merton & Co., Ltd., the well-known metal merchants of London, dated April 17th. Firstly, as regards copper. European statistics disclose the following:—The Chili Charters for the past fortnight are cabled as 550 tons, including 150 tons shipped direct to America. The supplies for the same period were 25,702 tons, against 21,628 tons deliveries. The visible supply has therefore increased 1,074 tons, and now stands at 27,203 tons. On the 31st ulto. the quantity was 26,129 tons.

Total Stocks.	April 15, 1914.	March 31, 1914.	April 15, 1913.
England and France ...	12,732	11,739	26,851
Hamburg and Rotterdam	7,278	7,147	10,543
Bremen	1,093	1,093	2,346
	21,103	19,979	39,740
Afloat from Chili and Australia	6,100	6,150	6,050
Total visible supply...	27,203	26,129	45,790

The shipments from New York, Philadelphia, and Baltimore for the week ending 17th April are cabled as 11,668 tons. When business was resumed after the holidays operators were by no means inclined to be optimistic in view of the continued depression in general business in the United States, pending the decision on the freight question, which keeps the entire country in suspense and effectually checks all commercial and industrial enterprise. In addition to this restraining factor, the fresh complications which have arisen between Mexico and the Washington Government have helped to upset the Stock markets very seriously. Under those conditions Copper was hardly likely to maintain the improvement recently established, and when bull speculators endeavoured to liquidate their holdings they found an unwilling market with buyers very reserved. Lower prices had to be conceded at once in order to market some fair lines of Standard Copper, and after an initial transaction at £65 10s. three months, we dropped steadily until £64 was accepted for early warrants, and £64 7s. 6d. for forward delivery. A rally then set in, and the market became steadier around £65, the fortnightly statistics being considered not unfavourable. We finish with a steady tone at £64 13s. 9d. cash, £64 17s. 6d. three months. Producers' prices for refined copper are unchanged at £68, but second-hand parcels have been offering cheaper, and found some ready buyers amongst Continental manufacturers. In this country general activity has not been resumed yet, and America also reports a very quiet market. We quote tough at £69 5s. to £69 15s. less 2½ per cent.; best selected at £69 5s. to £69 15s. less 2½ per cent.; electrolytic at £66 15s. to £67 net; strong sheets at £82; India sheets at £79; and yellow metal 6⅞d. The total transactions during the week amounted to about 5,700 tons.

As to tin, Messrs. Henry R. Merton & Co. report:—During the Easter holidays there was quite a considerable demand for tin from consumers on the Continent as well as in America, and good prices were realised for delivery up to the winter months. When the London market opened on Tuesday the optimism had, however, already evaporated under the influence of surrounding conditions, and speculative holders were quite ready to supply all the metal that was wanted at moderate prices. After some business at £169 10s. three months, prices fell away rather sharply, and by Wednesday £165 15s. was accepted for this delivery, while cash went to £163 15s. Thereafter the tendency became rather more settled, consumers came again forward, picking up fair lines of metal, and covering purchases in our market were resorted to with the result that prices recovered smartly, and close firm at £166 5s. cash, £168 5s. three months. The East was a very willing seller throughout, accepting the London parity for good quantities from day to day. The shipments to date amount to nearly 2,500 tons. The total transactions during the week amounted to about 2,400 tons. English ingot tin £166 to £167.

Enquiries are often received at this office as to the prices of other metals, and the following figures may therefore prove of interest to some of our readers:—Lead: The present level of prices is undoubtedly attractive to consumers, who have again taken in substantial quantities for near and forward delivery; even the Home trade is now participating more readily in the buying movement. The market has consequently been very firm, and values have stiffened in the absence of American competition. We close £17 12s. 6d. to £18 for Foreign, and £18 to £18 10s. for English. Spelter: Business continues on a very restricted scale, but signs are not wanting that consumers will shortly have to make fresh purchases for their requirements. Trade in galvanised sheets is slack, but after such a prolonged period of dulness, a change may set in at any moment. The London market has been quiet, but shows a firmer tendency, due to covering orders. We close at £21 10s. to £21 12s. 6d. for ordinaries, and £22 to £22 5s. for specials. Iron and Steel: Owing to the holidays business on the warrant market has been quiet, and prices have had a sagging tendency, finally closing at 50s. 8d. cash, 50s. 10d. one month, 51s. three months. The iron and steel trades, both on this side and in America, still remain in a depressed condition, and very little business is passing. Aluminium: £81 to £85 per ton. Antimony: £28. Quicksilver: £7 per bottle, first hands. Silver: 26 13-16d. spot, and 26⅞d. forward. Fine Silver: 28 15-16d. spor, 29d. forward.

ASBESTOS AND CHROME IRON IN RHODESIA.

The Victoria Occurrences—Mr. Ackermann's Favourable Report.

IN our last issue we gave some particulars of the chrome iron ore and asbestos discoveries in the Victoria district. The following additional particulars are culled from a report by Mr. A. H. Ackermann, resident mining engineer of the British South Africa Company, on the occurrences. In the course of his report Mr. Ackermann states:—

Judging by present indications it should be possible to cob at least 60 to 70 per cent of the total mineral recovered, the remainder being sent to the machines, and of this quantity I estimate not more than 20 per cent. of the ground mined would have to be sent to the machines. The seams of chrysotile are easily separated from the enclosing serpentine rock by tapping with a hammer. This naturally will be a great saving as far as costs are concerned. It would be safe to say that the rock mined to date has averaged 5 per cent. asbestos, and judging from the various faces I consider this figure can be looked upon as a conservative estimate, and for matters of calculation I propose using it. Present working shows a profit of approximately £7 14s. 6d. per ton, which should be increased to £9 when the railway, now under construction to Victoria, is completed. This profit, on the basis of 200 tons a day, should yield a profit of £2,160 per mensem. The profit can naturally be adjusted to the quantity of labour employed in the extraction of the mineral. In an endeavour to arrive at some calculation I have mapped out a square block containing all the principal workings, and where the serpentine outcrops are much in evidence carrying asbestos. This area measures 1,560 feet by 840 feet equal to 100,000 tons per foot, or a profit of £36,000 per foot. In order to be extremely cautious I propose cutting this figure in half and estimating a profit of £18,000 a foot, and assuming the continuity of the deposit to 50 feet, the total profit figures at £900,000. These figures must not be taken too seriously, and are only presented with the idea of showing the possibilities of the property. I understand that in Canada the greatest depth attained in the working of asbestos mines is 200 feet, whereas the continuity has been proved to 400 feet. I see no reason why the deposit should not, after a few months' preliminary work, be able to produce on the lines such as I have suggested for a capital expenditure of £15,000.

General Remarks.—From a perusal of previous remarks, it will be evident that I am much impressed with the possibilities of this asbestos property, and although little work has been undertaken to prove the extent of the area, the indications at present are certainly most encouraging, and lead me to venture the opinion that it will be the means of opening up a new and extensive industry in Rhodesia. The attractive features to my mind are, firstly, the high quality of the asbestos; secondly, the comparatively large percentage of asbestos in the rocks as so far proved; thirdly, the finding of payable asbestos in every working place in the area referred to and outside; fourthly, the inclination of the hill, making it possible for a cheap system of bench mining; fifthly, the near proximity of a perennial supply of water and cheap wood; and sixthly, the past satisfactory results of the owner's operations which were undertaken under most adverse conditions. In reviewing all these facts, it must be evident that the possibilities ahead of the King's Asbestos are distinctly cheery, and I see no reason why a company with a capital of £125,000 should not be able, on the lines I have suggested, to yield a profit of at least 20 per cent. on the issued capital for many years to come.

The report on the chrome claims is a short one, and Mr. Ackermann has pointed out: There being no development work so far undertaken it is therefore impossible to gauge the extent of the chrome deposits. Samples taken on the Western Blocks were low grade, but on Blocks 379 and 380 where larger quantities of the mineral exist, the quality is quite payable, and for the outcrop samples can be considered distinctly encouraging. I would suggest that immediate steps should be taken for the development of these deposits. A few months' serious development work on these deposits should open up sufficient payable chrome to justify the extension of the railway from Victoria to the bottom of the hill. I look upon these holdings as being of considerable value to the King's asbestos claims.

The Utilisation of Solar Energy.

A paper on this subject was read before the Society of Engineers (Incorporated) recently, by Mr. A. S. E. Ackermann, who has been associated with the work (as joint consulting engineer with Mr. C. T. Walrond, to the Sun Power Company and the Shuman Engine Syndicate) for nearly four years. The author gives determinations of the solar constant, and deals fully with the carying percentages of this quantity that are available throughout the day for power purposes. He then describes four types of Shuman sun heat absorbers, and gives in great detail the results of his 48 trials of these absorbers, the latest pattern (that erected near Cairo, Egypt) of which gives a maximum thermal efficiency of no less than 40.7 per cent., and a maximum output of steam of 1,442 lbs. per hour at a pressure of 15.8 lbs. per sq. abs. The results of these types of absorbers are compared by means of tables and curves, and from these the author has constructed a formula by means of which it is easy to calculate for a given type and size of absorber the total output of steam per hour if three things are known—(1) the time of day, (2) the humidity, and (3) the steam pressure. It has been known that humidity adversely affects the quantity of solar radiation arriving at the earth's solid surface, but this is the first time that its effect on solar steam production has been quantitatively determined. The difference between the thermal efficiency of the solar boiler and the commercial value of the steam produced is ingeniously brought out, the author making it clear that in the case of such low-pressure boilers a high thermal efficiency is not necessarily the same thing as the most economical conditions of working, and he shows that, up to a certain limit, the higher the steam pressure, the more economical the working, though the thermal efficiency is then lower. Two of the types of absorber did not move with the sun, and one did. The greater constancy of output of steam in the case of the latter is very marked. In order to utilise the low-pressure steam economically, Mr. Frank Shuman designed a special engine, which has also gone through several stages. This engine is fully described with drawings, and the author gives the results of his 14 trials of the several engines and compares their results with those of exhaust-steam turbines and the low-pressure cylinders of compound and triple-expansion engines, showing that the Shuman engine is the more economical. The steam consumption of one of these engines was only 22.1 lbs. per b.h.p.-hour when the output was 94.5 b.h.p, and the steam pressure only 16.2 lbs. per sq. in. abs. The thermal efficiency of the engine compared with an engine working on the Rankine cycle was 54.75 per cent. In the case of a Shuman high-pressure non-condensing engine with an outupt of 29 b.h.p., the steam consumption was 23.8 lbs. per b.h.p.-hour and the relative thermal efficiency 71.7 per cent. Finally the author gives the results of his trials of the complete sun-power irrigation plant at Cairo, and describes his design of a special form of weir tank for measuring greatly-differing quantities of water.

Discussing the question of unifying the Rand, a London contemporary says:—" The total nominal capitalisation of the field stands at over £60,000,000 (plus some £8,000,000 debentures), on which the annual yield has recently worked out at nearly 12 per cent. What " The Rand, Ltd.," would be capitalised at we should not care to prophesy. But although at first blush one might expect that it would achieve the honour of being the world's biggest industrial undertaking, it is doubtful whether it would beat the United States Steel Corporation with its issued capital of over £170,000,000 and bonded debt of some £130,000,000."

Rhodesian Section.

LATEST MINING NEWS.

Chamber of Mines' Report—Globe and Phoenix Company's New Shaft—The Jumbo G.M. Co. —A New Flotation—Twelve Months at the Lonely.

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of March, states:—Receipts during the month amounted to £61 18s. 1d., and payments to £215 11s. 7d. The balance to credit of current account, 31st March, was £232 17s. 3d. Fixed deposits totalled £700. The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of January and February, 1914:—

	January.	February.
Local	9,518	9,888
Portuguese Territory	6,814	6,684
N.W. Rhodesia	3,934	4,018
N.E. Rhodesia	5,721	5,562
Nyasaland	7,277	7,467
Other Sources	953	867
	34,220	34,486

The number employed in February, 1914, shows an increase of 2,778 as compared with the same month of 1913. Increases are from Portuguese Territory, N.W. Rhodesia, and Nyasaland, while Local, N.E. Rhodesia and Other Sources show decreases. The distribution for the months of December, 1913, and January, 1914, was as follows:—

	December.	January.
Producing gold mines ...	23,959	28,342
Non-producing gold mines ...	7,836	4,382
Coal and other mines	1,403	1,496
	33,198	34,220

* * * *

It is understood that the Globe and Phoenix Gold Mining Company has temporarily ceased sinking work on the vertical shaft, and is now commencing to erect a new head gear and more powerful machinery. The shaft, according to advices from Que Que, has created more than one new record in the country, inasmuch as it has reached a depth of over 2,000 ft. without the loss of a single life, and as the average cost per foot is pounds below any other shaft of like dimensions sunk in South Africa. The new hauling gear and latest type of engines, together with the aerial carrying tramway, will be one of the most up-to-date plants in the country.

* * * *

The following cablegram was dispatched from the local to the London office of the Jumbo Gold Mining Company in mail week, in reference to the recent strike on the Jumbo mine:—"Refer to our telegram of 31st. C. E. Parsons reports indications unfavourable, but further cross-cutting is being done No. 4 level, and crosscut No. 5 level is being pushed on to strike the reef if possible."

* * * *

Amongst the new companies registered in London, we notice the following:—Victoria (Rhodesia) Asbestos: Registered April 8; capital, £50,000, in £1 shares. Objects: To take over any mines, mining and mineral properties, grants, concessions, and mining, water, and other rights in Africa or elsewhere, and to carry on the business of miners, prospectors, explorers, metallurgists, workers of asbestos properties, etc., and to adopt an agreement with the Charterland Exploration and Finance Company, Ltd. First directors (not less than two nor more than five) to be appointed by signatories.

Presiding at the annual meeting of the Rhodesia Gold Mining and Investment Company, held in London in mail week, Mr. C. F. Rowsell gave the following interesting account of the Lonely Reef Mine, in which the Rhodesia Gold Mining and Investment Company is largely interested:

> As you may be aware, this company paid during last year three dividends of 10 per cent., making a total distribution of 30 per cent. for the year. The results secured on the 8th and 9th levels of this property were extremely satisfactory, the 8th level averaging 32.2 dwts. over 43.4 ins. over a total length of ore exposed of 900 ft., and the 9th level averaged 30.6 dwts. over 42.4 ins. for a length of 680 ft. exposed at the end of the year. The 10th level, upon which the principal work of the year has been concentrated, has, however, unfortunately not turned out quite so well. Up to the end of the year 441 ft. had been driven on this level, the assays averaging 20.28 dwts. over 47.9 ins. Driving is being continued to the south, and, although at the present time we are passing through a low-grade zone, it is expected that at any moment we may strike good ore again, as in the No. 4 winze from the 9th level ore of high grade was proved to a point very close to that which the drive has now reached. It is unfortunate that just at this period when the developments were in a poor zone it should have become necessary to alter the method of working the mine. Owing to the dip of the ore body away from the vertical shaft, necessitating longer and longer crosscuts at each level, it was decided to sink an incline shaft from the 9th level, which could more closely follow the dip of the reef. At the same time this new shaft had to be equipped with machinery and certain alterations made to render the plant suitable for carrying on operations at the lower depths now reached. All this work has now been carried out, and the incline shaft has been sunk 265 ft. below the 9th level, but it will be some months yet before it can reach the 11th level. According to the latest cable advices which, we are informed, the Lonely Reef Gold Mining Company have received from the mine, the No. 1 winze sunk from the 10th level, after passing through low-grade ore for some distance, has now reached the depth at which it is intended to drive the 11th level. Driving north from the foot of this winze, the first 5 ft. gave 11 dwts. over 41 ins., the next 9 ft. averaged 1 oz. 4 dwts. over 37 ins., and the last point assayed—19 ft. from the winze—gave 1 oz. 15 dwts. over 42 ins. Driving south from this winze, the first 5 ft. gave 14 dwts. over 40 ins., the next 8 ft. 9 dwts. over 51 ins., and at 17 ft. the reef averaged 8 dwts. over 53 ins.—an average for the whole distance so far driven on the 11th level—namely, 35 ft.—of 16 dwts. over 47 ins. I need not, I think, emphasise the fact that these results secured in the lowest level of the mine, after passing, as we have done, through an undoubtedly low-grade zone, are very important and encouraging for the future, although it is, of course, too early yet to form any judgment as to what the value of this level will be. The ore reserves of this mine are very satisfactory, as, according to the latest information, the total on March 31 was 167,000 tons, of a value of 16.91 dwts. As the company is crushing about 5,500 tons per month, it will be seen that they have 2½ years' ore ahead of the mill. The profits being earned by the company are in excess of the amount required to pay the dividends at the same rate as last year.

Rezende Mines.

The results at the Rezende Mines for April are as follows:—Central Section, £1,893; Old West Workings and Penhalonga Sections, £912; estimated profit, £2,805.

MINING INSTITUTE.
TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.
Prof. YATES prepares candidates for the following Government Certificates:—
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South African Investments.

To the Editor, *South African Mining Journal.*

Sir,—Please ask your readers to name the three best securities, which yield the highest rate of interest, plus amortisation, on current valuations, and give short proofs of their contentions; also which three companies have the greatest speculative chances outside their present dividends, and why. You should give a medal to the best reports on these subjects, you to be the judge and decide the matter. All the articles are to be in hand—and the best published if possible—by next week. Actual proofs, not flowery reports, to be the final tests, which may be decided by your subscribers if you do not wish to decide the finals, or this may be left over for one year and leave time and results to settle the question if necessary. Increases or decreases in profits (or both) to count as " speculative chances " as well.—Yours, etc.,

INVESTOR.

First Aid versus Safety First.

To the Editor, *South African Mining Journal.*

Sir,—As I wish to obtain the necessary certificate to fulfil Mine Reg. 277 (3), I have been earnestly studying " First Aid in Mining." All was " plain sailing " until I reached Chapter IV., which deals with " Accidents from Poisonous Gases "; here I became confused, and without further explanation I am afraid I shall get " plucked " at the exam. On page 66 we are informed that CO_2 is a heavy gas, *considerably heavier than air* (Sp. Gr. 1·52), and hence it tends to remain at the bottom of close or deep workings, or it may drift along from a drive and settle in the nearest winze. Now, if gases are subject to the laws of gravity, as stated above, why are we told that CO (Sp. Gr. ·96) is the predominant cause of the common cases of gassing down a winze? (page 72.) This again precludes the probability of finding carbon dioxide in raises and back-stopes. Is this the reason that these places are not mentioned as likely points of danger? There have been numerous cases of CO_2 gassing in this class of working place—that is, if the flame test given on page 67 is to be relied on as an indicator. In a footnote on page 67 we are informed that it takes 50 per cent. of CO_2 to extinguish an acetylene lamp. As I watched a friend of mine climb up a back-stope until his lamp flame gradually died out, the said footnote is asking me to believe that 50 per cent. of CO_2 is *not* fatal—my friend is still alive. In mentioning gassing in back-stopes, I am not forgetting that carbonic acid gas has a s.p. of 1·52, but to this I must bracket the flame test—the only test given. " Since percentages of carbonic acid gas as high as 10 per cent. or over are not known to occur in the air of metalliferous mines " (page 67), I am wondering where the 50 per cent. test was made. The following statement speaks for itself:—" When explosives are ignited in quantity those who can should get at once to the windward side of the fumes; if the accident occurs in a drive, get into one of the stopes below." As the air currents in my stopes are all *downcast*, and the Sp. Gr. of NO_2 is 1·05 and that of its partner (CO_2) 1·52—" considerably heavier than air "—I should be looking for trouble by following the advice given above. I have great respect for the " First Aider " and have had much valuable assistance from him in cases of accident, but most of my acquaintances agree with me that " Safety First " ought—and must—take precedence of First Aid. Hence my desire for information which will forward this movement and so make *less* work for the ambulance man. My wish to possess a certificate is only a secondary consideration.—Yours, etc.,

W. LACEY.

West Rand.

Madagascar Conditions.

To the Editor, *South African Mining Journal.*

Sir,—So much has been said and written about Madagascar during the last few years, so much unfair criticism has been raised in this country against the great island, owing to the failure of many schemes brought before the public, without sufficient information on hand at the time, to justify the appeal, that a few notes on Madagascar will, I hope, prove interesting. Prior to French occupation in 1895, and in spite of the moral pre-emption right of France over the island, owing to her long-established settlements at various points on the coast; the British influence was great; regular steamers flying the British flag used to call at most of the important ports of the island, British officials were in the Hova Government service, the consular service had ramifications, now done away with, and in spite of the uncertainty of trading with the natives and the corruption prevailing amongst the Hova officials, the British spirit of adventure and enterprise was not lacking; while perhaps a state of chaos existed on the one hand, it was far easier to adjust matters then, of what it is now, this I must admit, as it is far easier to adapt an impromptu law to a country in a semi-savage state than to apply European laws with their enactments to a country not entirely ready to receive them. This point is one which has no doubt scared many intending settlers, which has driven away many a prospector, and which has caused, with very few exceptions, large investments of foreign capital into the island to withdraw at the earliest opportunity. As an instance, the application of the French Customs laws and tariffs to Madagascar, and their highly protective duties, debars practically always the merchants, settlers and traders from availing themselves of their natural market, viz., South Africa, which does not even benefit of the minimum tariff rates applying to Great Britain, but is taxed at the maximum although a British Colony. If any preferential treatment were accorded to South Africa, I have very little doubt that a regular, constant and ever-increasing trade would be created to the mutual advantage of the two countries. In a recent Consular Report, the French Consul-General pointed out that it was surprising that South Africa and Madagascar, so near to each other, so well adapted for a regular intercourse, and with so many resources whose exploitation, if based on their merits, might give rise to large and well-paying undertakings, should on the other hand keep aloof and in fact ignore each other. A large amount of useful work has no doubt been performed since the advent of the French into the island, and much more is contemplated, but can it be expected that such a large country as Madagascar after 20 years only of French regime should have risen to the high standard of civilization such as we boast of in South Africa? Many factors which have contributed to make South Africa what she is to-day, such as huge diamond and gold discoveries, have so far no precedent in Madagascar, but no doubt if certain modifications in the general policy of the administration of the Colony were to take place and a far less egoistic spirit were to prevail at home, our neighbours would be able to encourage us to come forward with settlers and capital.—Yours, etc.,

" YOUR FORMER DURBAN CORRESPONDENT, NOW IN MADAGASCAR."

PROSPECTOR wants financial backing for promising deep lead (diamonds) formation under Karoo sandstone; also reef proposition in same district. Diamonds found. Reef going from 4 dwts. to 6 ozs. £200 required.—Apply " H.H.," c/o *S.A. Mining Journal*, Box 963, Johannesburg.

ABRIDGED PROSPECTUS

OF THE

FOLAKARA OIL FIELDS, LIMITED.

(To be Incorporated under the Company Laws of the O.F.S. Province.)

NOMINAL CAPITAL	£110,000

In 110,000 Ordinary Shares of One Pound Sterling each, allocated as follows:—

Shares issued as fully paid to the Vendors...	£55,000
Working Capital	55,000
	£110,000

Of the 55,000 Working Capital Shares, 33,750 are now offered for subscription. 21,250 Shares to be held in reserve.

SPECIAL NOTE.—Of the Shares in reserve, subscribers for Working Capital Shares shall (on completion of their payments) have a free option on, or the right to increase their original application by 25 per cent. on the same terms and conditions. Such right or option to be exercised on or before the 30th June, 1916.

IMPORTANT.—The attention of subscribers is specially drawn to the fact that practically the whole of the vendors' interest will be locked up for two years, and probably retained as a fixed asset of the Proprietary Company.

TERMS OF PAYMENT.—Two shillings per share on application. Two shillings per share on allotment. Two shillings per share per month (payable on or before the 15th of each month) until fully paid. First monthly payment in the month next following that in which allotment is made.

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TRANSVAAL SECRETARY AND OFFICE:

C. W. HERALD, 71, Standard Theatre Buildings, Joubert Street, Johannesburg: P.O. Box 2089; Telegraphic Address: "Sakalava": Telephone No. 4838.

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FRASER AND SCOTT, Solicitors, 55, Maitland Street, Bloemfontein, Orange Free State.

PARIS OFFICE:

SOCIETE PETROLIFERE SAKALAVE, 19, Rue Duphot, Paris. Secretary: Herbert H. Boyd.

SOLICITORS:

VAN HULSTEYN, FELTHAM & FORD, P.O. Box 46, Johannesburg.

CONSULTING ENGINEER:

MONS. D. LEVAT, Chevalier of the Legion of Honour, Member of Superior Conseil, Special Envoy of the French Minister of Colonies, Ancien Eleve de l'Ecole Polytechnique, Paris.

FIELD MANAGER AND TECHNICAL ADVISER:

S. A. R. SKERTCHLY, M.Inst.M.M., Mining and Metallurgical Engineer, Ankavandra, Madagascar.

AUDITOR:

C. E. NELSON, Managing Director, United Safe Deposit, Limited; Registered Public Accountant, Fox Street. Telephone No. 1429, Johannesburg.

BANKERS:

THE NATAL BANK, LIMITED, Market Street, Johannesburg.
THE NATAL BANK, LIMITED, St. Swithin's Lane, London, E.C.

OBJECTS.

The Company is being formed with the objects mentioned in the Memorandum of Association, inter alia:—To acquire Oil prospecting rights over 1[illegible],750 acres of carefully Petroliferous Land on the well known Folakara Anticline, known as Anticline "C," situate in the Betsiriry Valley, West Coast of Madagascar.

The Company proposes to drill on the Anticline to locate Oil Reservoirs, as advised by Mons. D. Levat, in his Official Report to the French Minister of Colonies (published during the year 1912), and also in his Special Report to the Sakalava Madagascar Proprietary Oil Fields, Limited, in 1913, which may be inspected at the office of the Company.

THE FOLAKARA ANTICLINE.

In his official report to the French Minister of Colonies and to the Governor General of Madagascar, Mons. David Levat states, inter alia:—"The Folakara Anticline lies perceptibly in a north to south direction, i.e., in parallel lines with the great cliff of Bemahara. It is the one nearest to this great cliff, and consequently possesses the greatest probable thickness of triassic petroliferous formation, it being at least 28 kilometres away from the Archean edge.

"This important fold stretches quite regularly over a length of more than 40 kilometres, frequently landmarked along the whole of this distance by outcrops consisting of pools and runnels of inspissated naphtha."

SEEPAGES.

There are seepages of Oil on both flanks of the Anticline. One seepage is very large, and even during the dry season flows slowly but constantly at the foot of an impregnated coarse sandstone bank 20 feet high.

BORING SITE.

The Boring Site selected is excellently placed, being situated on the banks of the Manambolomaty, thus assuring a plentiful supply of water all the year round, while on the opposite bank there is a forest of big trees, which will provide a good, cheap and abundant fuel for the boilers.

CONCLUSIONS.

In concluding his report, Mons. Levat states, inter alia:—"I have no reason to change my opinion expressed in 1911 on the Folakara Anticline. It is very unfortunate for everybody it has not been drilled upon up to now. By its position and features this property is a very valuable one and must be drilled with a powerful machine able to reach 3,000 feet in depth.

"This ground can be floated immediately into a subsidiary company."

Full reports and maps of the property, also samples of the Crude Oil and Oil Saturated Sands, can be inspected at the Company's office during the hours of 9 a.m. to 8 p.m., Saturdays included.

REMARKS.

The capital is small and the area large in comparison with European flotations. In fact, the area is sufficient for 20 companies compared with a London prospectus now lying at the office of the Company. The claims offered are amongst the most promising of the whole field. (Vide Levat's Report.)

The extent of the anticline and the indications and geological formation give promise of striking Oil in quantity at a reasonable depth.

GENERAL.

In addition to Mons. David Levat, the following eminent Oil geologists and engineers have reported on the Oil prospects of the Sakalava Valley, Madagascar:—

Sir Boverton Redwood, Adviser on Petroleum to the Admiralty, etc., London states, inter alia:—"Occurrence is of great importance."

Mr. H. T. Burls, M.Inst.M.E.F.S.S., London, states, inter alia:—"The deposit would be equal to any requirements."

Dr. J. M'Clelland Henderson, late of Johannesburg and the Wyoming Oil Fields, states, inter alia:—"Indications are good for the finding of Petroleum in economic quantity."

Dr. Hans Merensky, Consulting Geologist and Mining Engineer, Johannesburg, states, inter alia:—"Geological conditions are quite favourable for the occurrence of Oil wells."

Mr. Thos. Draper, late Consulting Geologist to the Shell Transport and Trading Company, Borneo, states, inter alia:—"I have no hesitation in recommending these claims to the favourable consideration of investors, and confidently anticipate a successful career for any company that may be formed."

Extract from Mons. D. Levat's Official Report to the A.M. le Ministre des Colonies et a M. le Gouverneur-General de Madagascar et Dependances, sur les Mines a Madagascar, page 245.

ANALYSIS OF THE OIL.

Water...	1.20
Coke	12.70
Gasoline (Naphtha)	14.00
Kerosene	25.80
Lubricating Oils	40.50
Parafine Wax	1.90
Gas and Loss...	3.90
	100.00

Full and additional copies of the Prospectus will be furnished on application to the—

FOLAKARA OIL FIELDS, LTD.,
71, Standard Theatre Buildings,
Joubert Street, Johannesburg.

P.O. Box 2089.
11th May, 1914.

Applications can be handed in at any branch of the Natal Bank, Ltd., in South Africa, or Direct to the Office of the Company.

FOLAKARA OIL FIELDS, LIMITED.

FORM OF APPLICATION FOR SHARES.

To the Directors of the
FOLAKARA OIL FIELDS, LTD.,
71, Standard Theatre Buildings,
Joubert Street, Johannesburg, P.O. Box 2089.

Gentlemen,—Having paid to ....

the sum of £.................................... being a deposit of Two Shillings per share on .... shares in the above-named Company. I request you to allot me that number of shares upon the terms of the Company's Prospectus, dated 11th May, 1914, and I hereby agree to accept the same or any smaller number that may be allotted to me, and to pay the balance of Eighteen Shillings per share as follows:—

Two Shillings on Allotment.

Two Shillings per share on or before the 15th of the month following allotment.

Seven other instalments of Two Shillings per share on or before the 15th day of each following month, as provided by the said Prospectus;

And I authorise you to register me as the holder of the said shares.

Name (in full) ....
(Mr., Mrs. or Miss.)

PLEASE
Usual Signature ....

WRITE
Address ....

DISTINCTLY.
Occupation ....

Date .... 191......

APRIL GOLD OUTPUT IN DETAIL.

Improved Returns for Short Month— Statistics of Production.

The April returns of the Chamber of Mines are as follows:—

Total output	683,877 ozs.
Value	£2,904,924
Decrease	2,924 ozs.
Value	£12,422
Witwatersrand	655,607 ozs.
Value	£2,784,842
Decrease	2,101 ozs.
Value	£8,926
Outside Districts	28,270 ozs.
Value	£120,082
Decrease	823 ozs.
Value	£3,496
Total Stamps	9,695
Increase	33
Witwatersrand	9,175
Increase	55
Outside Districts	520
Decrease	22

The following are comparisons between March and April of this year as declared by the Chamber of Mines:—

The Witwatersrand.

	March. £	April. £	Increase. £	Decrease. £
Aurora West...	18,456	11,702	—	6,754
Bantjes Consolidated	28.855	27,644	—	1.211
Brakpan	68.541	66,192	—	2,349
City and Suburban	49.851	49,558	—	293
City Deep	80.881	84.415	3.534	—
Consolidated Langlaagte	56.146	58.950	2,804	—
Consolidated Main Reef	31,442	31,998	556	—
Crown Mines...	241,700	247,001	5,301	—
Durban Roodepoort	15,058	14,468	—	590
Durban Roodepoort Deep... ...	31,892	33,799	1,907	—
E.R.P.M....	210,131	213,381	3,250	—
Ferreira Deep	111,609	105,463	—	6,146
Geduld Proprietary...	30,104	28,286	—	1,818
Geldenhuis Deep...	66,367	67,683	1.316	—
Ginsberg	18,333	17,981	—	352
Glencairn	15,785	15.084	—	701
Knight Central...	24,790	23,078	—	1,712
Knights Deep	61,707	69,454	7,747	—
Langlaagte Estate	59,264	58.151	—	1,113
Luipaardsvlei	19,786	18.788	—	998
Main Reef West	24,458	24,216	—	242
May Consolidated	8,534	8,835	301	—
Meyer and Charlton...	34,458	34.326	—	132
Modder B	64,221	61,431	—	2.790
New Goch	33,170	32,206	—	964
New Heriot	23,923	23,456	—	467
New Kleinfontein	69,068	68,970	—	98
New Modder	95,960	92,558	—	3.402
New Primrose	27,360	26.119	—	1.241
New Rietfontein	6,788	6.643	—	145
New Unified	14,633	14,085	—	548
Nourse Mines	58,360	57,693	—	667
Princess Estate	30,588	28,557	—	2,031
Randfontein Central	246,589	243,353	—	3,236
Robinson	85.231	87,346	2,115	—
Robinson Deep	65.024	58,933	—	6,091
Rood. U.M.R.	21,226	21,888	662	—
Rose Deep...	86,441	84,793	—	1.648
Simmer and Jack	64,026	60,823	—	3,203
Simmer Deep	39,487	40.515	1,028	—
Spes Bona Tribute	4,668	5.114	446	—
Van Ryn Estate	51,211	54,048	2.837	—
Van Ryn Deep	64,757	66.260	1,503	—
Village Deep	70,504	70.262	—	242
Village Main	60.131	63,745	3.614	—
Vogelstruis Estate	14.718	14,472	—	24
West Rand Central	3,768	4.167	399	—
West Rand Consolidated	30,490	33.638	3.148	—
Witwatersrand	50,403	47.676	—	2.727
Wit. Deep	52.995	56.431	3.436	—
Wolhuter	42.634	42.239	—	395
Miscellaneous	7.246	6.968		278

Outside Districts.

	March. £	April. £	Increase. £	Decrease. £
Nigel	19,034	19.930	896	
Sub Nigel	10,067	9.222	—	845
Sheba	13,104	13,780	676	—
Quest	3,160	2.808	—	352
Ceylon Lydenburg	1,066	1.058	—	8
Glynn's Lydenburg	7.960	8.678	718	—
Transvaal G.M. Estate	41,165	35,881	—	5.284
Worcester	3.938	3,959	12	—
Barrett	1.121	1.134	13	—
Miscellaneous	22,963	23,632	669	—

THE LABOUR POSITION.

The labour supply continues to improve. During the month 2,956 more natives were employed by the Witwatersrand Native Labour Association and contractors, and of these the gold mines got 2,190. The number employed on the last day of the month was as follows:—On gold mines, 165,005; on coal mines, 9,625; on diamond mines, 14,150; total, 188,780.

PROFITS.

The following comparative statement will show that the Central Mining, the Rand Mines, E.R.P.M. and Neumann groups all show increases in profits, most of them small, but of importance:—

	March.	April.
Rand Mines:—		
Central Mining	£226,713	£238,501
Subsidiaries	215,372	215,488
Gold Fields group	68,389	64,690
East Rand Proprietary Mines ...	60,512	63,983
Kleinfontein group	23,505	22,545
Barnato group	104,704	104,493
Albu group	62,762	61,719
Neumann group	50,738	52,427
Cons. Mines Selection	19,927	18,194
Goerz group	11,193	9,683

TWELVE LEADING COMPANIES.

The twelve principal producers during April were as follows:—

	Stamps.	Tubes.	Tons.	Value.
Crown Mines	660	24	184,000	£247,001
Randfontein Central ...	950	29	209,596	243,353
East Rand Proprietary	820	25	140,000	213,381
Ferreira Deep	260	7	54,100	105,403
New Modder	180	7	51,000	92,558
Robinson	250	6	50,300	87,346
Rose Deep	300	7	66,000	84,793
City Deep	150	9	41,500	84,415
Village Deep	180	7	50,300	70,262
Knights Deep	400	11	103,000	69,454
New Kleinfontein ...	200	4	51,400	68,970
Geldenhuis Deep ...	300	7	48,000	67,683

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

The Witwatersrand.

Company.	Tons Milled.	No. of Stamps.	Tube Mills.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	8,706	80	—	2,755	11,702
Bantjes Consolidated ...	22,300	100	3	6,508	27,644
Brakpan Mines..	45.730	140	8	15,583	66,192
City Deep.	41.500	150	9	19,873	84,415
City and Suburban	24.950	155	2	11.667	49,553
Con. Langlaagte Estate ...	47.100	90	9	13.878	58,950
Con. Main Reef	20,280	90	3	7.533	31,998
Crown Mines	184,000	660	24	58,149	247,001
Durban Roodepoort . .	13.945	90	1	3.406	14.468
Durban Roodepoort Deep ...	24.840	100	3	7,957	33.799
East Rand Prop. Mines ..	140.000	820	25	50,234	213.381
Ferreira Deep . .	54,100	260	7	21.828	105,463
Geldenhuis Deep .	48,000	300	7	15,951	67,683
Ginsberg	14,513	75	1	4.233	17,981
Glencairn Main Reef . .	20,500	160	-	3,551	15,084
Geduld Prop. Mines	17,300	50	5	6,659	28,286
Knights Deep...	103,000	400	11	16.351	69.454
Knight Central	19,050	90	3	5,433	23.078

Company.	Tons Milled.	No. of Stamps.	Tube Mills.	Total Gold obtained. Fine Ozs.	Total value.
Langlaagte Estate	47,147	200	5	13,690	58,151
Luipaardsvlei Estate	17,530	60	3	4,423	18,788
Main Reef West	18,090	90	3	5,701	24,216
May Consolidated	11,090	100	—	2,080	8,835
Meyer and Charlton	14,736	75	2	8,081	34,326
Modderfontein B	34,200	80	5	14,462	61,431
New Goch	29,300	120	4	7,582	32,206
New Heriot	12,900	70	1	5,522	23,456
New Rietfontein	51,400	200	4	16,237	68,970
New Modderfontein	51,000	180	7	21,790	92,558
New Primrose	22,900	155	2	6,149	26,119
New Rietfontein Estate... ...	6,631	110	—	1,564	6,643
New Unified	12,430	60	1	3,316	14,085
Nourse Mines	43,500	260	7	13,582	57,693
Princess Estate	25,000	60	5	6,723	28,557
Robinson	50,300	250	6	20,563	87,346
Robinson Deep	44,660	115	8	13,874	58,933
Randfontein Central...	209,596	950	20	57,290	243,353
Roodepoort United M.R. ...	23,009	55	3	5,153	21,888
Rose Deep...	66,000	300	7	19,962	84,293
Simmer Deep	49,950	180	9	9,538	40,515
Simmer and Jack	68,000	320	7	14,319	60,823
Spes Bona Tribute	5,600	40	—	1,204	5,114
Van Ryn Deep	40,000	80	8	15,589	66,260
Van Ryn Gold Mines	38,600	140	6	12,724	54,048
Village Deep	50,300	180	7	16,541	70,262
Village Main Reef	30,050	160	4	15,007	63,745
Vogelstruis Estates	12,707	75	—	3,407	14,472
West Rand Central	2,331	20	1	9,810	4,167
West Rand Consolidated ...	26,100	100	4	7,919	33,638
Witwatersrand	26,100	100	4	7,919	33,638
Witwatersrand Deep	41,300	245	4	13,285	56,431
Wolhuter	33,000	120	4	9,944	42,230
Miscellaneous Producers ...	—	—	—	—	6,968
Outside Districts.					
HEIDELBERG—					
Nigel	12,700	75	1	4,692	19,930
Sub-Nigel	4,600	25	1	2,171	9,222
BARBERTON—					
Barrett	—	—	—	267	1,134
Sheba	6,300	60	—	3,244	13,780
Worcester Exploration	6,000	40	2	932	3,059
LYDENBURG—					
Ceylon Lydenburg	650	5	—	249	1,058
Glynn's Lydenburg	3,864	20	1	2,043	8,678
Transvaal G.M. Estate	13,735	75	3	8,447	35,881
KLERKSDORP—					
Quest	4,231	35	—	661	2,808
Miscellaneous producers . .	—	—	—	—	23,632

New Kleinfontein.

Kleinfontein group: Monthly results, New Kleinfontein Company, Ltd.: Stamps, 200; days run, 28·755; tube mills, 4; tons milled, 51,400; gold recovered, 16,236·822 fine ozs.; net value, £68,230 15s. 6d.; profit, £22,515 4s. 11d.; working costs (excluding development), 16s. 7·734d.; development to working costs, 1s. 1·584d.; total working costs, 17s. 9·318d.; capital expenditure, £899 11s. 4d.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	41,300	£55,781	£21,440
Wolhuter	33,000	41,739	14,220
Consolidated Main Reef...	20,280	31,662	9,744
Main Reef West	18,090	23,940	4,023
Knight Central	19,050	22,792	3,000
Total for Group ...		£175,914	£52,427

Robinson Group.

The results of the Robinson group for April are as follows:—Langlaagte: Tons milled, 47,147; total yield, 13,690 fine ozs.; estimated profit, £15,039; per ton milled, 6s. 4·55d. Randfontein Central: Tons milled, 209,596; total yield, 57,290 fine ozs.; estimated profit, £71,277; per ton milled, 6s. 9·61d.

Brakpan Mines.

Stamps working, 140; running time, 24 days; ore crushed, 45,730 tons; tube mills working, 8; ore hoisted, 50,883 tons; ore from dump, 1,920 tons; waste sorted, 12·83 per cent.; fine gold declared, 15,583 ozs.; value declared, £65,613, equal to 28s. 8d. per ton milled; working costs, £47,419, equal to 20s. 9d. per ton milled; working profit, £18,194, equal to 7s. 11d. per ton milled.

MINING MEN AND MATTERS.

Mr. W. Eglington has resigned his position as Chairman of the London Committee of the Diamond Mining Investment Co., Ltd., Johannesburg.

* * * *

The list of certificates issued by the Mines Department for the month ended 9th May, 1914, is as follows:—Mine Surveyors: K. V. Cunliffe, E. E. A. de Kock, C. Endley, E. A. Mitchell, A. S. W. Wood. Mine Overseers (Metalliferous Mines): J. Ashbridge, I. B. V. L. Dale, J. Gartrell, W. E. Jones, R. Meyer, E. J. Phillips, J. C. Wylie.

Geduld Proprietary.

The working profit at the Geduld Proprietary during the quarter ended 31st March came to £21,247 9s., the working costs being 24s. 6d. per ton. The value of the gold recovered came to £87,065 9s., or 32s. 5d. per ton. For the three months the footage sampled on the reef totalled 1,245 feet, assaying 8·5 dwts. over 35·2 inches. The tonnage milled was 53,650, and the expenditure on capital account £3.509 0s. 1d.

THOS. COOK & SON,
Established 1841.
TOURIST AND STEAMSHIP AGENTS, BANKERS, Etc.
Passages Booked by ALL LINES TO ENGLAND (by East & West Coasts) and ALL PARTS of the WORLD
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Engineering Notes and News.

"FIRST COST AND FINAL COST."—II.

The Case for Cast Iron in the Water-Mains Controversy.

[By a Special Correspondent.]

It must always be remembered that, though the steel pipes are lighter and therefore may be initially cheaper than cast-iron pipes, they, just by reason of their thinness, even if they were (as they are very far from being) as little liable to corrosion as cast-iron pipes, would have a much shorter life, and would stand to be renewed three or four times as often, entailing every score of years, at the outside, substantial cost and great inconvenience. Without dwelling upon the influence of the "arch enemy of steel," corrosion—which affects cast-iron scarcely at all—we leave this array of claims, we submit, as badly perforated as a steel tube after a service of a dozen years!

Staggering Cases for Steel.

The champion of steel tubes made no stronger case when he played the game of illustrative instances. He enlarged upon the successes of steel in the distant Commonwealth, where Labour influences are a powerful factor, but, strange to say, neglected instances of its failures under his own nose in his own Union—to wit, Ladysmith, De Aar, and Port Elizabeth. He made a great parade of statements eight years old by a Californian engineer, but failed to relate what has happened in New York State within the past twelve months. Take Troy City, for instance: though steel piping was installed only fourteen years ago, the Water Department has been most urgent in its demands for the delivery of some seven miles of cast-iron pipes to replace the steel pipes which have been condemned out and out as unserviceable and irreparable. Again, Atlantic City, where there are now five lines, may justly be described as the mausoleum of steel piping. What has been the history of a 30-inch steel pipe laid there in 1901? Within three years, notwithstanding a much vaunted coating, innumerable holes rusted right through the shell, while the interior became incrusted with deposits; and though the steel pipe had been particularly prepared to meet the known adverse conditions, it gave out utterly within twelve years. The first cast-iron pipe laid thirty-two years ago is still in use, and it now finds a fellow in the same metal in a 27,000 feet 48-inch main laid across the meadows upon concrete bolsters. Here cast-iron has surpassed all other materials in its resistance to corrosive agents, and it final adoption after experiments with wood stave and with steel constitutes a triumph the like of which steel cannot offer. The gallant defender of steel—overlooking curiously enough the more recent case of Vienna, where, after due consideration the authorities rejected a proposal for steel pipes and installed over 40,000 tons of cast-iron pipes—found support in a couple of small towns in Austria, but he ignored the fortunes of steel tubes in Germany, where there has recently been published a big volume upon the controversy, crowded with authenticated instances of failure of steel piping. Whereever they can be shewn the score or so of vivid photographs included in the book are bound to create a sensation, sadly to the detriment of steel pipes. Photograph No. 2 shows water pipes coated and wrapped with jute and tarred, which, though laid in July, 1910, were as early as July, 1912, being replaced with cast-iron pipes; No. 3 displays two pipes from a water main at Jena-Loebnitz, put down in 1904, which were corroded within seven years; No. 4 presents tubes from the Heusweiler water main lifted in 1913, after only three years' service, though cast-iron pipes in the same main show no deterioration; No. 6, though laid in the spring of 1908 required replacing in 1913, while castiron pipes in the same neighbourhood which have been in use for twenty years required no repair; No. 7, the main pipe from Falkenau, which is being replaced with a cast-iron after only about six years of service. None of these were cases of rivetting giving way, or defective welding; but in every instance the tubes were of the much advertised weldless variety and no precaution for their preservation by coating and jute wrapping would seem to have been omitted. And so on: the volume contains evidence sufficient to turn into a pillar of salt every engineer and surveyor in the Union who shall look back with regret to steel tubes because of the cheapness of their initial price! The champion of the weldless tubes further paraded several British towns of importance as patrons of steel; but in his list you searched in vain, I am sure, for the names of London, Liverpool, Bristol, Manchester, Sheffield, Newcastle, even Birmingham and Glasgow, the chief manufacturing homes of the steel tube.

"Even Thrice Eighty Years."

Steel tubes, it may reasonably be claimed, have a short life, and their superintendents not a merry one. Failures on the part of cast-iron pipes, on the other hand, are not to be discovered in the chronicles of the engineers; while prolonged service are the invariable rule both in this country and upon the Continent. The attempts of the "tubists" to overthrow these evidences by allegations as to a radical difference in the composition of modern iron are incapable of proof—the references in the new German volume would in themselves be an adequate repudiation of the statement; and cast-iron mains can be confidently employed with the assurance that they will give service not merely for 80 but double and even triple 80 years. It is hard to extract humour out of cast-iron pipes, but the notion that the engineering experts of the Local Government Board would give 75 and even 100 per cent. better terms to cast-iron rather than to steel mains sheerly out of platonic affection for classic iron is comic enough to set a congress of deaf mutes in a roar!

"The Man is a Fool."

The true reason why steel tubes get any "look in," let it be recognised frankly, is discoverable in the mistaken impression that their initial cost is less than the initial cost of cast-iron pipes, for the apparent economy is secured only

What are You going to do with Your Sons?

Ensure their SUCCESS. Let us take them in hand.

We teach IN MONTHS, NOT YEARS:

AUTOMOBILE ENGINEERING.
MOTOR DRIVING AND REPAIRING.
FITTING AND TURNING.
ELECTRICAL ENGINEERING.

Make Your Sons Chauffeurs, Surveyors Mechanics, &c.

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E. W. BENDER,

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174, Commissioner Street, Johannesburg.

Box 3810. **DO IT NOW!** Phone 4228.

The Third Annual MINING EXHIBITION

(Under the auspices of the Chemical, Metallurgical and Mining Society of S.A.)

To be held in the

Volunteer Drill Hall, Twist St., Johannesburg,

May 19th to 29th, 1914.

"S.A. MINING JOURNAL"

Special Mining Exhibition and "Safety First" Supplement,

TO BE ISSUED MAY 23rd, 1914.

A Special Illustrated Supplement will be included in the "S.A. Mining Journal" of May 23rd, dealing with the Third Annual Mining Exhibition. Among the chief contents will be the following:—

LEADING FEATURES.

- The Use and Function of Mining Exhibitions.
- Chemical and Metallurgical Apparatus at the Exhibition.
- Mining Machinery and Models on View.
- Some Natural Products of S.A. and their Industrial Possibilities.
- The Promoters and Organizers of the Exhibition (illustrated).
- New Devices and Labour-saving Inventions (illustrated).
- Some Rock Drill Exhibits.
- The New Hammer Drills and their Significance.
- Some Stamp Battery Improvements.
- The Progress of Modern Wire Rope Manufacture (illustrated).
- Important Metallurgical Specialities.
- Mine Rescue Apparatus and "First Aid" Appliances.
- Results of S.A. Red Cross Society Competitions.

SPECIAL "SAFETY FIRST" SECTION.

- The "Safety First" Committee Competition.
- Winning Ideas and Devices (described and illustrated).
- Progress of the "Safety First" Movement on the Rand.
- A Review of Work Done by the "Safety First" Committee of the Rand Mutual Assurance Company.
- Results of the Movement Elsewhere.
- "Safety First" Devices (illustrated).
- The Mines Department and the Movement.
- The Mines Department Accident Museum (illustrated).

THE SOUTH AFRICAN MINING JOURNAL

P.O. Box 963. *Advertising Department,* P.O. Box 963.

176-180, Stock Exchange, JOHANNESBURG.

by the unwise reduction in the margin of safety. In exchange for that seeming advantage, meagre as it is, a terribly heavy penalty is from the start imposed upon the community. Unnecessarily imposed, too, for, even from the viewpoint of first cost, it can be shown upon any equitable basis of equal factors of safety, steel tubes, according to different diameters, cost from 50 to 30 per cent. more than cast-iron pipes, and cast-iron pipes cost from 33 to 25 per cent. less than steel tubes. Taking an example founded upon 2,000 ft. of each of two sizes, it is demonstrable that, as the steel tubes will have to be renewed three times within 45 years, the total cost in steel would be £1,000, as compared with £334 for cast-iron—or a loss of £666 to the citizens finding the money. Ultimate cost, not first cost, is the only basis for wise decision when the choice of material in this matter of mains is under consideration. The man, whoever he be, whatever be his position, is a fool who in the selection of steel pipes treats first cost as final cost. All of which goes to prove that those who spend the monies of the communities upon steel tubes instead of upon cast-iron mains are deliberately rejecting the painful lessons of costly experience within the Union. Is there any excuse for the man in South Africa who with the disastrous experience of De Aar, Ladysmith, and Port Elizabeth, expects to save money by installing steel pipes rather than cast-iron pipes for permanent work?

THE DEVELOPMENT OF TUBE MILL LININGS.

A satisfactory review of the history of the tube mill in its application to ore dressing, the literature of which is somewhat scattered, is given by H. S. Gieser, of La Fundicion, Peru, in the *Engineering and Mining Journal* of February 18. Facts concerning the early introduction of this type of mill into the metal industry are given by the author; variations in the practice, as it affects feed, pebble-load, speed of operation, etc., and a discussion of the various sizes and the types of liners. The relatively long tube of moderate diameter seems to still prevail, in spite of a tendency in certain places toward the short mill of greater diameter. That portion of Mr. Gieser's article which deals with the tube linings formerly and now in use is alone considered in this review. Wooden blocks were early tried for tube mill liners, but they only lasted a few days. Then smooth iron plates, 1 inch thick, were used for some time. Then silex blocks, 2½ inches thick, were used, the thickness being later increased to 4 inches, then turned on end, giving a thickness of 6 or 7 inches. At the Treasury mine, on the Rand, in June, 1905, silex lining cost half as much and lasted two and a half times as long as smooth iron liners. On the Rand they have a hard, compact flint near-by that has given excellent results and has consequently been very popular. However, the ribbed type has been growing in favour. From tests made at the Simmer and Jack mine, a silex lining gave 133·5 tons of sand, 54·6 per cent. of which passed 90-mesh, and an Osborn liner, 139·5 tons, 57·2 per cent. of which was —90-mesh. The ribbed liner was originally introduced at El Oro, but its use is now world-wide and its modifications endless. Each district seems to have something a little different. One of the best modifications (says the author) is used on the Rand and known as the Osborn liner. It consists of bars of flat iron laid lengthwise alternately flat and on edge. The latter are generally wedge-shaped and the bars come in lengths, so that one, two or three pieces completes a course. They are held in position by iron wedges. Using a bar slightly less than the length of the mill has the advantage that it is less liable to become loose and fall. When these long bars become worn at the feed end they are taken out and the ends reversed. Using three pieces to a course has the advantage that as the head section becomes worn a new one is put in. Later the section is changed, and later still, the third. This system is used at the East Rand Proprietary Mines, in the Transvaal. Twelve hours only is necessary to change a lining, the work being done by the regular tube-mill shiftman, working overtime. The life of an Osborn liner is about 300 days. One great advantage of this type is that thin iron wedges only are used, so there are no bolts to get loose, and, consequently, no sloppy floors, as with the El Oro liner. The total volume of a 5½ x 22-foot tube mill is 523 cubic feet, and with new 6-inch liners is 350 cubic feet, holding 10½ tons of pebbles (105 pounds to a cubic foot) when filled 3 inches above centre line. With a 3-inch liner it holds 12·8 tons and up to 14 tons as the lining wears. The Komata liner, though not new, has been attracting some attention in Nevada of late. It consists of longitudinal ribs 18 inches apart, with plates between, ⅜-inch thick at edges and 1 inch in the middle. The plates lasted in one case 75½ weeks and angle bars 60½ weeks, grinding 76 tons per day. The advantages claimed are maximum capacity, no slipping of pebbles, best metal distribution for greatest endurance, and as the lining does not alter shape much, the speed is nearly constant. F. C. Brown, in speaking of the advantages of this liner, gives for silex lining, consumption of flints and lining, 3·61 pounds, costing $0·035; Komata liner and flints, 1·44 pounds, costing $0·017. Life of the liner was 80 weeks and the working area of a 4-foot 10-inch by 19-foot tube mill was increased 20 per cent. by its use. In this connection the experience at Black Oak mill, in California, is interesting. A 5-foot diameter by 18-foot tube mill was lined with smooth cast-iron liners 13½ inches wide, but it did not do good work, so iron strips 3 inches wide and 2 inches thick one to each alternate row of liners, was put in, and the efficiency improved. Then one strip to each row of liners was put in and the efficiency fell off. The number of strips was reduced again to one for each alternate row of liners and the efficiency improved once more. The addition of these strips improved the efficiency by 13½ per cent. and the life of the liners was lengthened. This proves the efficiency of the lifting power of the strips. The most effective crushing of hard grains is by impact, and the falling pebbles of a tube mill are like the falling stamps of a battery. The higher they are lifted and the more of them that are lifted, the more work there is done. The rounded grains of sand particles is evidence that there is some work done by abrasion, but it is probably not important except in extremely fine grinding. The practice in the Tonopah district, in Nevada, lately described by Megraw, is contrary to that in all other parts of the world. The operators there claim better results with smooth liners both as to character of product, its quantity and cost of production. Objections to silex are cost and time necessary to reline, about 24 hours in a well managed plant. However, at the Extension mill, at Tonopah, one tube mill is fitted with ribbed liners for coarse crushing and the other with smooth liners for fine crushing. Iron balls were originally used as the crushing material, but were too expensive, so flint pebbles from the Danish coast were then tried and proved satisfactory. Since then, flint pebbles from other parts of the world have been successfully used. Selected pieces of ore were early tried and where hard and compact enough, answer very well. They have the advantage of being far cheaper and that no barren material is being crushed and treated. This is an important matter when it is considered that at some large plants on the Rand 2½ per cent. of the ore treated is tube mill pebble.

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THE CARE AND PROTECTION OF WIRE ROPES.

Utility and, in special measure, safety are the considerations which govern the selection and care of wire rope in mine use. Many of the most serious accidents which occur in mining are those which arise in the hoisting department. Oversight of the hoisting ropes is therefore of supreme importance. Care of wire ropes is discussed in a practical and comprehensive way by Letson Balliet in the *Mining and Engineering World* of February 28. When hoisting rope is purchased, in the judgment of the author, the quality should be considered rather than the price. The sheave wheel should never be less than 30 times the diameter of the rope, and it is better if the sheave wheel is 40 to 60 times the diameter of the rope. In fact the larger the sheave wheel, the better it is for the rope. One can easily understand that by bending a 1-inch cable around a 30-inch sheave, that the friction of the wires over each other will be far greater than by bending the same rope aroung a 60-inch sheave. Furthermore, it takes more power to bend a cable around a 30-inch sheave than around a larger one. From the foregoing it is clearly evident that wire ropes should be lubricated, and lubricated with oils and greases that will penetrate between the wires of the strands. This not only makes friction lighter, with less wear upon the wires composing the rope, but it prevents rusting and pitting of the interior wires. Rope should never be coated or "doped" with anything that will harden on the outside, for this coating will crack by bending over the sheave and around the drum, and when it is lowered into a damp shaft—or when the humidity of the air is high moisture will penetrate the cracks of the coating and work its way into the very centre of the cable. This will in time cause the hemp core to become water-soaked, and it will act like a wet sponge in holding the moisture. In this way the wires on the inside of the rope will rust and pit, even though the coating may appear to be perfect upon the outside of the cable. Many a cable is in operation where the interior wires have been completely eaten off, and the entire load is being carried by the outside wires. This is extremely dangerous, because in the twist of the rope, any of the wires may come to the outside some place, and the only thing that holds them together is the friction exerted by the pull that is upon them. When the wires of a cable are worn half in two by abrasion on the outside, and rusted and pitted half in two by moisture on the inside, there isn't much strength left in the rope. Ropes that run in dry shafts should be lubricated for the reduction of friction; ropes that run in damp mines should be lubricated to prevent rusting and pitting. Again I repeat that ropes should never be coated. Good ropes should be elastic; when the elasticity is gone, the rope should be discarded. Occasionally the ropes should be reversed upon the drum; two or three men can do this in a few hours. Mr. Balliet describes his method of making the reversal. Another thing is that 15 or 20 feet of cable next to the cage should be cut off every few weeks or months: first, for examination of the rope's condition, and, second, because the removal of a portion furnishes a new spot on the cable to take the strain where it stands over the sheave. It is easy for the sheave wheel to get out of alignment, owing to the settling of frames. The author offers a word of caution against the careless looping of the cable around a thimble eye; the proper twist of the strands should be preserved in order to avoid unequal distribution of load upon the strands. Mr. Balliet declares that more wire rope is improperly used and cared for than otherwise; the ton-mileage and life of the cable used in the United States could be doubled on the average. He considers that rapid hoisting should be avoided. It is much better, in the author's judgment, to double the load than to double the speed. In doubling the load, we have a friction of but once over the sheave and once around the drum, with but one period of vibration and swing of cable to overcome; while, if the speed is doubled, we have the same friction to be overcome twice to accomplish the same tonnage.

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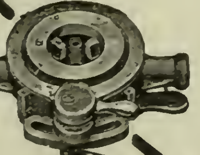

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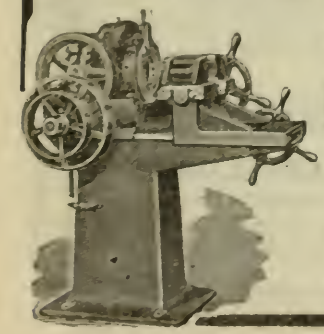

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S.A. Railway Progress.

The line from Sabi to Graskop will be opened on the 18th of May, from which date a tri-weekly service of trains between Nelspruit and Graskop will operate in both directions. A start has been made with construction work on the Bethal-Volksrust line, and it is expected that construction will also be begun during the present month on the Schroeders-Lot 14a line in Natal. Tenders have been accepted for a pumping plant for the Olifants River (Transvaal) water supply, and also for the supply of four steel lighters for Port Elizabeth.

* * * *

Lord Welby on South Africa.

Lord Welby, presiding at the half yearly meeting of the Standard Bank of South Africa, said that Labour unrest alone had checked the progress and prosperity of South Africa, and gave rise to much anxiety as to the future. The unrest, however, had not affected agriculture, in which a progressive spirit was developing with the removal of drawbacks, notably drought, disease and pests. Better transport, irrigation and other improvements should have the effect of an increased influx of new cultivators, which was essential to the prosperity of the country. It had been calculated that at the present rate of crushing the Rand industry had reached its zenith. There was no reason, however, to assume that science had reached the limit of its efficiency, and any reduction in working costs would greatly prolong the life of the Rand.

* * * *

Too Much Credit.

The Durban merchants have commenced a series of discussions in order to consider ways and means of dealing with the existing credit system. It is stated that in common with other South African centres, the state of competition is so keen and the scarcity of ready money so marked that in the interests of business generally the conditions, which allow accounts to be for so long outstanding as some firms permit them to be, need tightening up. It is well recognised that certain houses are in distinction with others, more particularly in connection with their customers, but the circumstances with respect to small European storekeepers are criticised in a like regard. It is emphasised that in view of the present economic conditions of the country terms of credit ought materially to be shortened, and a movement is likely to be set in restricting this practice, not only with the wholesale merchants, but also among the retailers as a class. Though there appears to be some divergence of opinion among the business people concerned on the subject it is anticipated that Durban will take the initiative in a concerted movement against the extension of credit.

* * * *

The Merchants Trust, Ltd.

Mr. J. Paterson presided at the annual meeting of the Merchants Trust, Ltd., last week. The figures showed the steady progress of the company. During the past year the volume of business transacted showed a very considerable increase, the figures being seventy-five insolvencies, representing liabilities of £132,795, and seventy-two assignments, compositions, and so on, representing £118,757 in liabilities, while the sum of £64,102 was distributed in dividends to creditors. The company had adhered strictly to its policy of closely investigating every estate, and a number of precautions in suspicious cases had resulted in several convictions. Insolvencies and offers of compositions had increased, and it was felt that merchants were too ready to compromise before thorough investigation in the dealings of debtors. The directors considered that while a number of insolvencies and compromises were directly due to the late industrial troubles, a large percentage were not so caused, as merchants were too ready to accept offers of settlement and to grant credit without investigation of the position of traders. The chairman declared that at no period in the history of South Africa had it been more necessary for business combination than at present. For some years they must still look to the gold, diamond and coal industries for the development of South Africa, but it was satisfactory to note the rapid growth of agriculture.

* * * *

Cape or Suez Route.

The Dominions Royal Commission Report gives some interesting facts about the comparative use of the Suez Canal and Cape routes to the East. It will probably surprise many people, as it did us, to learn that in 1912, of the total tonnage of British steamers clearing from United Kingdom ports to Australia and New Zealand, 25 per cent. went by the Suez Canal, as compared with 75 per cent. by the Cape. In the homeward trade about 40 per cent. used the Suez route, about 32 per cent. the Cape, and about 28 per cent. the South American route. One does not always realise, either, the fact that while the run of vessels from London to Melbourne via Marseilles and Suez is 11,978 miles the run via the Cape is 12,290 miles—only about 300 miles more. While the difference in the case of cargo is practically immaterial, passengers and the mail by travelling overland to the French port (the Australian mail railage to ensure this saving cost in 1912 the large sum of £68,000) reduce the travelling time considerably, and there is the additional advantage on the whole journey of more numerous coaling stations. Against this, however, the Cape route saves the enormously heavy canal dues, it provides much cheaper coaling, and the difference in time is calculated by the Dominions Commission to be in actual effect only about 12 hours in favour of the Suez journey. Speaking generally regarding the Cape route, the Commissioners, in their report, state that were equal rapidity of delivery possible for mails by the Cape route there would be a saving of the railway charges, of Suez Canal dues, and a further saving through the cheapened cost of coal. On the Suez route the longest stretch without re-coaling is from Colombo to Fremantle, 3,121 knots. On the Cape route to Australia the longest stretch is from Capetown to Adelaide, the distance between which is 5,587 knots, while the distance between Durban and Melbourne is only slightly less, viz., 5,370 knots. These distances, of course, can be shortened and made to correspond with that from Teneriffe to Capetown, if the vessels proceed to Fremantle, a distance of 4,715 knots from Capetown, and of 4,241 knots from Durban; in this event the route would have the advantage of the Australian transcontinental railway, when it is completed, for the overland carriage of mails.

* * * *

The Irrigation Report.

The importance of irrigation in the agricultural development of South Africa is reflected in the report which the Director of Irrigation, Mr. F. E. Kanthack, has prepared for the period from the 1st January, 1912, to the 31st March, 1913, and which has just been presented to Parliament. Emphasis is first laid on the need for increased engineering and clerical assistance. The history of water legislation is discussed in relation to the Union Irrigation Act, the principles of which are explained. Interesting details are given of reconnaissance surveys, principally in the Cape Province and the Orange Free State, and of the progress of Government irrigation settlements and Government works under construction. Dealing with irrigation loans granted under the Irrigation Act, the Director points out that up to the 30th June, 1912, loans were granted only in the Cape Province, under the Cape Irrigation Act. Naturally it took some time before the other Provinces became conscious of the facilities now existing for the raising of loans for the construction of irrigation works. The Cape Province heads the list and there has been a very great increase in the number of applications and especially in the amount of money applied for. Ten Cape irrigation boards applied for loans aggregating £213,600, all of which have been granted. The most remarkable activity was displayed in the Free

State, where fifty applications were received during the period of six months that the Act was in practical working. Most of these loans were for pumping plants, but there was also a large percentage of applications for very small loans of less than £250. At the end of the financial year 1912-13 the sum of £455,198 was outstanding in respect of irrigation loans and the amount in arrears in respect of principal and interest was almost negligible. Speaking of boring for farmers the Director points out that the most striking feature has been the demand for the services of the drills in the Mafeking and Vryburg districts. During the year a great development took place in the policy of boring on Crown lands to render them fit for settlement. Practically the whole of the Crown lands of the Union available for settlement, which are mainly situated in the Northern Transvaal, Bechuanaland and north-western districts of the Cape Province, are waterless and quite unfit for settlement till water has been found. In former years in the Cape Province such lands were given out in their original waterless condition and it was left to the settler to find water by boring or well-sinking. The usual result was an early abandoning of the farm, the settler being crippled by financial difficulties. Another attempt to open up this arid country was by means of water prospecting licences, with a grant of land to the finder of a useful supply of water, but the results have been miserable. The obvious policy of finding water first and then placing settlers on the improved farms has now been rigidly adopted and there can be no question about the policy being the only possible one to make these numerous tracts of country habitable.

Randfontein Central.

Report for quarter ended March 31. Revenue, £653,735 5s., or £1 3s. 1[illegible]d. per ton, from 546,753 tons milled; cost, £483,517 16s. 11d., or 17s. 8d. per ton; profit, £170,217 8s. 11d., or 6s. 2d. per ton; yield—mill 79,850 ozs., cyanide 75,978 ozs.; total yield, 155,823 ozs.; capital expenditure, £66,531; development, 106,519 cubic feet; ore reserves, 8,661,621 tons. The machinery and plant are in good order. The water supply is sufficient. Although the native labour position improved towards the end of the quarter, the mine is still short of requirements. The general strike in January caused a 3½ days' stoppage of the mills and subsequent disorganisation. In terms of the trust deed, £81,600 of debentures have been purchased at par in satisfaction of the obligation to redeem that amount on March 1, 1914.

Lonely Reef G.M. Co.

The following are the particulars of the output of gold from the Lonely Mine for the month of April, 1914:—Mill ran 25.57 days, crushed 5,100 tons; yield of fine gold, 915·164 ozs., value £3,847 1s. 8d.; slimes treated, 5,100 tons; yield of fine gold, 3,176·284 ozs., value £13,333 9s. 5d.; total recovery of fine gold, 4,091·448 ozs.; total value, £17,200 11s. 1d.; estimated profit, £8,900.

Zaaiplaats Tin.

The results for the month of April, 1914, were as follows:—Days run, 28.1 days; ore milled, 3,738 short tons; residues re-treated, 2,222 short tons; concentrates won, 102 long tons; average value of concentrates, 67.9 per cent. metallic tin; estimated profit for the month, excluding Government tax on profits, £3,711 10s. 9d.; less adjustments in respect of estimated values of previous shipments, £532 9s. 3d.; profit declared for the month, £3,212 1s. 6d.; capital expenditure, £646 17s. 9d.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

QUARTERLY REPORTS.

Witwatersrand Deep.

Expenditure and revenue for the quarter ended 31st March, 1914 (calculated on the basis of the tonnage milled), was as follows:—Expenditure, £100,222 10s. 3d.; profit for the quarter, £63,796; revenue, £164,018 10s. 3d. *Note.*—No allowance has been made in the above statement for interest on debentures or for the Government tax on profits. The capital expenditure for the quarter was as follows: Shafts, £1,618 0s. 8d.; buildings, machinery and plant, £5,546 6s. 8d.; total, £10,164 7s. 4d. *Milling.*—Stamps running, 245; time run, 79.21 days; four tube mills ran 81.65 days; tons crushed, 123,570; duty per stamp, 6.367 tons; yield in fine gold, 28,855.936 ozs.; yield per ton crushed, 4.67 dwts.; waste sorted, 14,422 tons—10.40 per cent. *Cyaniding (sands and slimes).*—Sands treated, 75,585 tons; slimes treated, 48,369 tons; yield in fine gold, 10,175.270 ozs.; yield per ton crushed, 1.65 dwts.; recovered from all sources employed per ton milled, 6.32 dwts. *Mining.*—Ore in bins 1st January, 1914, 920 tons; ore mined, 138,672 tons; waste sorted (10.40 per cent.), 14,422 tons; tons crushed, 123,570 tons; ore in bins, 1st April, 1914, 1,600 tons. *Shaft Sinking.*—The South Incline Shaft has been sunk 44.5 feet, to a total depth of 193.5 feet. The South Incline Shaft has been timbered 10 feet, to a total depth of 30 feet. The West Incline Shaft has been sunk 118.5 feet, to a total depth of 2,142.5 feet. The West Incline Shaft has been timbered 125 feet, to a total depth of 2,100 feet. *Development.*—Drives and crosscuts, 1,571.5 feet; raises and winzes, 1,012.0 feet; drives from stopes, 304.5 feet; total footage for quarter, 2,888.0 feet. Cutting 17th level engine station, south incline shaft, 1,730 tons. *Reef Values.*—Of the total development 2,415 feet, or 83.62 per cent., have been on reef. Altogether 2,353 feet have been sampled. The total comprises 1,642 feet, or 69.78 per cent., averaging 7.95 dwts. over 48.80 inches, and 711 feet, or 30.22 per cent., averaging 3.59 dwts. over 34.57 inches. *Ore Reserves.*—Payable ore exposed, 31st December, 1913, 1,666,000 tons at 6.80 dwts. over 52.81 ins.; payable ore developed during quarter ending 31st March, 1914, 122,441 tons at 6.77 dwts. over 64.75 ins.; total, 1,788,441 tons at 6.80 dwts. over 53.48 ins. Less ore mined from payable blocks during quarter ending 31st March, 1914, 80,320 tons; payable ore on 31st March, 1914, 1,708,121 tons at 6.80 dwts. over 53.48 ins. *General.*—The amount of water pumped for the quarter was 86,824,800 gallons and cost £3,617 2s. 5d. net to pump, equal to 7.03d. per ton milled.

Ferreira Deep.

The Ferreira Deep quarterly report for the period ended March 31st, 1914, shows a profit of £177,924. Development work was as follows:—Number of feet driven, sunk and risen, exclusive of stopes, 2,451. The reef disclosures were as follows:—Main Reef Leader: Distance exposed, 918 ft.; width, 31 ins.; assay value, 71s. 5d. South Reef: Distance exposed, 965 ft.; width, 16 ins.; assay value, 96s. 7d. *Reduction Works.*—Ore received from mine, 178,726 tons; waste sorted out, 12.2 per cent.; tonnage crushed, 156,990 tons; number of stamps operating, 245; number of tube mills operating, 7. Value of ore before crushing (reflected by mill yield and value of pulp) (the value per ton is calculated at 84s. per fine oz.): Mill yield per ton, 28s. 10d.; assay value of pulp, 12s. 8d.; total, 41s. 6d. Total yield, 75,729 ozs. fine; total yield per ton, 40s. 7d.; accumulated slimes, tonnage treated, 1,820 tons; accumulated slimes, yield 223 ozs. fine. No. 2 incline shaft was deepened 27 feet during the quarter, and is now completed. Driving east and west on the leader on the 12th level at this shaft has been started, and also cross-cutting to the South Reef. The sinking of No. 1 incline shaft will be resumed on completion of the cutting of the 14th level station and ore box. The crosscut on the 12th level, to develop the claims south-east of the Grahamstown dyke, has encountered this dyke, and is now being advanced therein. The disclosures on both reefs are higher; the values in the ground east of No. 1 shaft, which show considerable improvement, point to the probability of more payable ore being obtained in this section than previous development had indicated; during the six months ended 31st March, 1914, 42,400 tons, of a value of 43s. 3d. per ton, were returned as developed, and further tonnage was exposed by driving, which, however, cannot be treated as developed until fully exposed and valued. Underground conditions have been further improved by the starting of the ventilating fan on the 12th level at No. 1 shaft, which is now converted into a downcast. The miners' strike in January affected the crushing, which was 3,330 tons lower than the previous quarter. Working costs per ton were slightly higher, but the profits at £177,417 were increased by £21,653. This was due to an increase in the yield of 3s. 8d. per ton, brought about chiefly by the special clean-up made in the reduction works immediately prior to the January labour troubles. Although the native labour position shows some improvement, the mine still suffers from a decided shortage. An amount of £2,488 was expended during the quarter on capital account; an estimated sum of £3,301 being still required to complete the work at present authorised. An interim dividend (No. 22) of 25 per cent. was declared on 17th March, 1914, for the half-year ending 31st March, 1914, and will be payable on or about 5th May, 1914, from the Head and London Offices, to shareholders registered on the company's books at 31st March, 1914. Holders of share warrants will receive payment of Coupon No. 22 attached thereto, on presentation at the London office, or at the Crédit Mobilier Français, 30 and 32, Rue Taitbout, Paris.

THE WEEK IN THE SHAREMARKET.

Quiet and Steady—Little Business Doing—Cheerful Outlook.

The market remains quiet and steady, though at the beginning of the week prices showed a tendency to ease off. The New Heriot dividend of 30 per cent., and the cheerful speeches made at the Central Mining meeting in London appear to have had a good effect. The Central Mining speeches should offset the bad effect of the recent passing of the dividend by that corporation. Tin and diamond shares remain in the doldrums, and until the market for the products improve little improvement can be expected.

* * * *

	Fri. 8th.	Sat. 9th.	Mon. 11th.	Tues. 12th.	Wed. 13th.	Thur. 14th.
Adair-Ushers	—	0 5*	—	0 5*	0 6	0 5*
African Farms	11 9	12 1	12 0	12 0	12 0*	12 0*
Apex Mines	—	—	19 0†	—	17 6*	18 0*
Aurora Wests	8 6*	—	—	—	8 6*	—
Bantjes Consolidated	15 0†	—	15 0†	—	14 0†	—
Brakpan Mines	—	—	42 0†	—	—	—
Breyten Collieries	—	27 0*	27 0*	27 0*	27 0*	27 0*
Bushveld Tins	0 8†	0 7*	—	—	0 6*	0 6*
Cassel Coals	15 0*	15 0*	15 0*	15 0*	—	—
City and Subs.	48 0*	47 9*	48 0*	47 6*	48 3	48 3*
City Deeps	65 0*	64 9*	64 0*	64 0	64 0*	63 6*
Cloverfield Mines	—	4 9†	4 1*	4 0*	4 2*	4 0*
Clydesdale Collieries	9 3*	—	—	9 6*	—	—
Con. Langlaagtes	31 9*	31 9*	31 9*	31 9	31 9*	31 9*
Con. Main Reefs	17 1	17 3	17 0*	17 0*	17 0*	17 1*
Con. Mines Selections	7 6*	—	—	—	—	—
Coronation Collieries	—	—	—	20 0†	15 0*	—
Coronation Freeholds	0 4*	—	—	0 4*	0 4*	0 4*
Crown Diamonds	—	—	—	—	5 3*	5 3
Crown Mines	—	—	—	—	115 0*	—
Crown Mines Deb.	£98½*	—	—	£98½*	£98½*	—
Durban Roodepoorts	—	19 6*	—	20 0*	—	—
Durban Rood. Deeps.	—	17 0	17 6†	—	—	—
East Rand Centrals	2 0*	2 0*	2 0*	2 1*	2 0*	2 0*
East Rand Coals.	1 6*	1 6*	—	1 6*	1 6*	1 6*
East Rand Deeps	1 6*	—	—	—	1 5*	1 5*
East Rand Props.	35 9*	35 9	35 0*	35 0	34 0*	35 0*
East Rand Debs.	—	£84*	—	—	£85*	£85*
Eastern Golds	1 0*	1 0*	—	1 0*	1 0*	1 0*
Frank Smiths	3 9*	3 3	—	3 0*	3 7*	3 9
Geduld Props.	—	—	22 0*	—	22 6*	—
Glencoe Collieries	—	6 6*	—	—	7 0†	6 6*
Glynn's Lydenburgs	11 6*	—	12 0†	10 0*	11 0*	11 0*
Govt. Areas	20 3*	20 3	19 9*	20 0	20 3	20 0*
Joh. Bd. of Ex.	24 0†	24 0†	—	23 9†	24 0†	—
Jupiters	4 9*	—	5 3†	—	—	4 0*
Kaalfonteins	0 5†	0 6†	0 6†	0 6†	0 4†	0 4*
Klerksdorp Props.	2 4*	2 4*	2 3*	2 3*	2 4*	2 4*
Knight Centrals	8 9*	8 6	8 6	8 0*	8 3*	8 0*
Knights Deeps	35 0*	—	—	—	—	34 0*
Lace Props.	3 0*	3 1*	3 0*	3 0*	3 1*	3 0*
Langlaagte Estates,	—	—	—	18 0*	—	17 6*
Luipaardsvlei Estates	—	—	—	—	9 6*	9 6*
Lydenburg Farms	2 8*	2 8*	2 8*	2 6*	2 6*	2 6*
Main Reef Wests	6 3*	6 3*	6 3	6 0*	6 0*	6 6†
Middelvlei Estates	1 0*	1 0*	—	1 0*	1 0*	1 0*
Modder B.'s	—	82 0*	—	—	82 6*	83 0*
Modder Deeps	47 3	46 0*	46 6	46 6*	46 6*	46 9*
Natal Navigations	15 0*	—	—	—	—	—
New Eland Diamonds	—	—	—	—	—	27 6*
New Era Cons.	5 6*	5 6*	5 6*	5 6*	5 9†	5 9†
New Geduld Deeps	1 96	1 9*	1 9*	1 9	1 9*	1 9*
New Gochs	14 0*	14 0*	—	13 6*	14 0*	14 0*
New Heriots	—	—	—	—	60 6*	61 0*
New Kleinfonteins	23 3	23 3	23 6†	—	23 0*	22 9*
New Modderfonteins.	250 0*	—	250 0*	250 0*	250 0*	250 0*
New Rietfonteins	—	—	3 0	2 6*	2 6*	3 0†
New Unifieds	16 0*	—	16 0*	16 0*	16 0*	16 0*
Orange Diamonds	1 0*	1 1*	1 2*	—	1 6†	1 0*
Pigg's Peak	9 9*	9 9*	—	—	9 9*	9 9*
Pretoria Cements	45 6*	45 6*	44 0*	45 0*	45 0*	45 6*
Princess Estates	4 6*	—	—	—	4 6*	4 6*
Rand Klips	—	2 6†	2 4*	2 3	2 3*	2 3*
Rand Nucleus	—	1 7*	1 7*	1 7*	1 7*	1 7*
Randfontein Deeps	3 3*	3 3*	3 3*	3 3*	3 3*	3 3*
Randfontein Estates	—	21 0*	—	—	21 0*	21 0*
Rooibergs	22 0	22 9	22 9	22 0*	22 9	22 6*
Ryan Nigels	2 6*	—	2 6*	—	3 0†	3 0†
Shebas	4 6*	4 6*	—	4 3*	4 6*	4 6*
Simmer Deeps.	—	—	1 6*	1 6*	—	1 6*
S.A. Brewieries	39 0*	39 0*	—	—	39 0*	—
S.A. Lands	2 8*	2 8*	2 8	2 7	2 6*	2 6*
Springs Mines	—	11 0*	—	11 3*	—	11 3*
Sub Nigels	10 9*	11 0*	10 9*	10 6	10 3	10 0*
Trans. Coal Trusts	28 0†	—	28 0†	—	27 0*	—
Trans. Con. Lands	—	—	—	28 0†	—	—
Trans. G.M. Estates.	36 6*	37 0*	36 6*	36 9*	37 3*	37 3*
Van Ryn Deeps	45 6	45 0	45 0*	44 6	44 9	44 3
Village Deeps	37 6*	—	—	—	37 0*	37 0*
Vogel Con. Deeps	0 9*	1 3†	—	—	—	—
West Rand Cons.	8 0*	8 0*	8 0*	—	8 0*	—
Western Rand Estates	2 0*	—	—	2 0*	2 0*	2 0*
Witbank Collieries	43 6*	43 6*	43 6*	—	43 6*	43 6*
Witwatersrands	72 6†	68 0*	—	—	—	67 6*
Wit. Deeps	52 0*	51 6*	52 0	51 9*	51 6*	51 6*
Wolhuters	13 6*	13 9*	14 0	13 3	13 6*	13 3*
Zaaiplaats	25 0*	25 6*	25 6*	25 0*	25 9*	25 3*

*Buyers †Sellers

*Buyers. †Sellers.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

May 20.—Apex Mines, New Kleinfontein (Annual).
May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).
May 27.—Consolidated Langlaagte Mines; Ginsberg; Glencairn; Government Areas; New Primrose; New Rietfontein; New Unified; Van Ryn Deep; Witwatersrand G.M. (annual).
May 28.—West Rand Consolidated; Roodepoort United; New Goch; Meyer and Charlton (annual).
May 29.—Cloverfield; Vogel. Deep; Knight Central (annual); Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries; Sacke Estates (annual).
June 2.—Modder. B.; Bantjes (annual).
June 3.—Crown Mines; Durban Roodepoort Deep; Village Deep (annual).
June 17.—S.A. Gold Mines; Leeuwpoort Tins; African Farms.
June 22.—Robinson Deep (annual).
June 23.—Transvaal Consolidated Lands (annual).
June 30.—A. Goerz & Co., Ltd. (annual); Robinson G.M. (annual).

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of April, 1914:—Tons crushed, 3,864, yielding 2,013 fine ozs.; estimated value of month's output, £8,602; estimated profit, £4,918.

Rooiberg Minerals.

Stamps, 10; days run, 27·17; tons milled, 3,198 short tons; concentrates, 103 long tons; average assay value metallic tin, 68·16 per cent.; estimated profit, £3,416 13s. 6d.; adjustments in respect of previous shipments to be subtracted, £460 10s. 2d.; profit declared for the month, £2,956 3s. 4d.; net capital expenditure, £1,519 5s. 7d.; £2,370 18s. 6d. has been included in working costs for the month in respect of shaft sinking, exploration and mine development. The average price of metallic tin on which the month's revenue has been determined is £158 15s.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—Lewis Waller Co.	8.15
Standard—Rayne Panmier Company	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

New Registrations.

Below is the list of new companies registered during the month of April:—

Press Cuttings, Ltd., 18 Permanent Buildings, Harrison Street, Johannesburg; capital £1,000.

The Goldfields Garage, Ltd., 58 Anderson Street, Johannesburg; capital £3,500.

Coll Lewis & Co., Ltd., 16 Sauer Street, Johannesburg; capital £500.

The Premier Co-operative Association of South Africa, Ltd., 11-17 Trust Buildings, Fox Street, Johannesburg; capital £1,000.

The South African Co-operative Creameries Agency, Ltd., corner of Fraser and Pritchard Streets, Johannesburg; capital £1,200.

E. Kallenbach, Ltd., 44 and 45 Sacke's Buildings, Joubert Street, Johannesburg; capital £1,000.

Craigie Mines, Ltd., 22 Corporation Buildings, Commissioner Street, Johannesburg; capital £12,500.

Riordan, Sheir & Co., Ltd., 29 Robinson Buildings, Commissioner Street, Johannesburg; capital £500.

Capital Trading Co., Ltd., 10 Bureau Street, Pretoria; capital £2,000.

South African Tanning Co., Ltd., 33 Moseley Buildings, President Street, Johannesburg; capital £5,000.

Spiros Pharmacy, Ltd., Meischke's Buildings, Harrison Street, Johannesburg; capital £800.

Lewis & Co., Ltd., Ryan's Buildings, corner of Marshall and Macintyre Streets, Jeppestown; capital £15,000.

Rand Bottlers' Co., Ltd., Post Office Buildings, corner of Rissik and Market Streets, Johannesburg; capital £1,500.

Save-All, Ltd., corner of Marshall and Nugget Streets, Johannesburg; capital £250.

The South African Farmers' Guide and Industrial Gazette, Ltd., 11-12 Steytler's Buildings, Market Square, Johannesburg; capital £10,000.

Magdala Developing Co. (Northern Transvaal), Ltd., 26 Steytler's Buildings, Market Square, Johannesburg; capital £2,400.

Occult and Psychotherapeutic Society, Ltd., 13 Henwood's Arcade, President Street, Johannesburg; capital £200.

A. M. Mostert, Ltd., Leake's Buildings, 5 Harrison Street, Johannesburg; capital £10,000.

The Sabie Assembly Hall, Ltd., Farm Grootfontein No. 1327, District Lydenburg (Sabie); capital £500.

Vaal River Salt Works, Ltd., Exploration Buildings, Fox Street, Johannesburg; capital £3,500.

The Skepko (South Africa) Ball-Bearing Co., Ltd., 23 Pritchard Street, Johannesburg; capital £10,000.

FOREIGN COMPANIES.

The Sakalava Madagascar Proprietary Oil Fields, Ltd., care of Charles Wilson Herald, 71 Standard Buildings, Joubert Street, Johannesburg; capital £100,000.

The Consolidated Pneumatic Tool Co., Ltd., care of H. J. Gregson, 3 and 9 Cullinan Buildings, Simmonds Street, Johannesburg; capital £300,000.

Opstal Diamond Syndicate, Ltd., care of Arthur Kenmuir, corner of Fort Street and Market Avenue, Benoni; capital £12,500.

The "Rowe" Sewage Purifying Syndicate, Ltd., care of Henry Rowe Rowe, 419 Consolidated Building, corner of Fox and Harrison Streets, Johannesburg; capital £2,000.

Naamlooze Vennootschap Harlingen tot Exploitatie van een Nederlandsche Landbouwnederzetting, en Vee Depot in Zuid Africa, care of Sipke Posthuma, Farm Harlingen, Bethal; capital 350,000 gulden.

ADDITIONS AND ALTERATIONS TO FOREIGN COMPANIES.

Henderson Transvaal Estates, Ltd., Johannesburg.
Harrisdale Diamonds, Ltd., Johannesburg.
Associated Mines of Rhodesia, Ltd., Johannesburg.

EXTRAORDINARY AND SPECIAL RESOLUTIONS.

Johannesburg Motor Mart, Ltd., Johannesburg: Amendment of articles.

The United (Heather Breakspear) Baking Co., Ltd., Pretoria: Change of name.

Machavie Claims Syndicate, Ltd., Johannesburg: Reduction of capital.

R. & J. Fleming, Ltd., Johannesburg: Increase of capital.

West Rand Fresh Meat Co., Ltd., Krugersdorp: Increase of capital.

Rustenburg Citrus Growers, Ltd., East Rand: Increase of capital.

Southey & Co., Ltd., Johannesburg: Amendment of articles.

L'Estrellita Tango Tea Gardens, Ltd., Pretoria: Change of name and amendment of articles.

United Jack Gold Mining Co., Ltd., Pretoria: Amendment of articles.

South African Mining Journal Syndicate, Ltd., Johannesburg: Conversion into private company.

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NOTICES OF INCREASE OF CAPITAL.

R. & J. Fleming, Ltd., Johannesburg: Increase from £37,500 to £45,000.

Agricola, Ltd., Johannesburg: Increase from £300 to £945.

S.A. Construction Co., Ltd. (foreign company), Johannesburg: Increase from £100,000 to £200,000.

Rustenburg Citrus Growers, Ltd., East Rand: Increase from £24,500 to £30,000.

Samuel Bros., Ltd. (foreign company), Johannesburg; increase from £150,000 to £300,000.

Harrisdale Diamonds, Ltd. (foreign company), Johannesburg; increase from £20,000 to £26,250.

VOLUNTARY LIQUIDATIONS.

The Whitehills Estate and Gold Mining Co., Ltd., Pretoria.
The Rhodesian Research Co., Ltd., Johannesburg.
Pretoria Master Building Trades' Association, Ltd., Pretoria.
Provincial Stock Farmers, Ltd., Johannesburg.
Golden Valley Syndicate, Ltd., Johannesburg.
Benoni Consolidated Gold Mines, Ltd., Johannesburg.
Sandbult Diamond Syndicate, Ltd., Johannesburg.
Abelheim, Landau & Co., Ltd., Johannesburg.
Carter Diamond Prospecting Syndicate, Ltd., Johannesburg.
Springbok Flats Exploration Co., Ltd., Johannesburg.
Modderfontein Proprietary Mines, Ltd., Johannesburg.

New Patents.

111. Christian Neumann.—Improvements in revolving members for blowers.
112. Edwin Septimus King and Head, Wrightson & Co., Ltd.—An improved method of and means for grinding, crushing and pulverising ores and the like.
113. James Rossiter Hoyle and Henry Warburton.—Improvements in and relating to tappets for stamp batteries.
114. Harry Byron Johnson.—Improvements in holders and shields or screens for candles and the like.
115. George H. Dorgeloh.—Improvements in liquid rheostats.
116. David Gillespie.—An under carriage for coco-pans.
117. Arthur Thackeray Edwards.—An improved form of resilient tyre.
118. William Ramsay.—Composite sleeper rail chair, securing rails to sleepers.
119. Herbert Owen Stidston Broadbent.—New and improved doors.
120. Robert George Mahon.—An improvement in the method of harvesting maize.
121. Christian Frederick Wienand and Arthur Dixon Arnold.—Improvements in rock drills of the detachable bit type.
122. Robert Farmer.—A combined lever for simultaneously operating the throttle valves and valves controlling the brake gear.
123. Charles Leonard de Wilde Reader.—Improvements in or relating to air and like fluid compressers and exhausters.
124. John Douglas Donald.—Improvements in linings for the ends of tube mills.
125. Herbert Owen Stidston Broadbent.—Self-balancing automatic sash windows.
126 Donald Barns Morison.—Improvements in apparatus relating to the withdrawal of air and water from steam condensers.

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CONTENTS.

PAGE
Notes and News 321
Topics of the Week:
  The Mining Exhibition 323
  The Government and the Future of the Far Eastern Rand 324
  The New Workmen's Compensation Bill 324
Individual Mines and Improving Returns 325
Pietersburg Goldfields Activity 325
Shaft Sinking at Daggafontein 326
Annual Report of the Secretary for Mines and Industries 326
Correspondence and Discussion: "The Fallacy of Cheap Labour" 328
The Manager and Staff of the Sub Nigel, Ltd. 329
Rhodesian Section:
  Latest Mining News 330
  Rhodesian Geological Survey 331
Rock Temperatures in the Mines of the Rand 333
Engineering Notes and News 335
  The Flying Train 335
  The Action of Acid Mine Water upon Electric Insulation 337
Finance, Commerce and Industries 338
The Week in the Sharemarket 339
Special Mining Exhibition and "Safety First" Supplement 341
  The Mining and "Safety First" Exhibition ... 341
  The Mines Department Accident Museum 341
  The "Safety First" Campaign on the Rand ... 342
  History, Aims and Progress of the Rand "Safety First" Movement 344
  The Winning "Safety First" Devices 345
  The "Safety First" Competitions: Exhibits Described 346
  "Safety First" and the Care of the Eyes 347
  Accident Prevention Devices Already Adopted ... 348
  The Publications of the "Safety First" Committee 349
  World-wide Progress of "Safety First" Movement in Mines 351
  The Prevention of Mine Accidents on the Rand ... 352
  Some Notable Commercial Exhibits 352
  Mine Safety Rules Selected, Classified and Condensed 353
  The Skefko S.K.F. Self-Aligning Ball Bearing ... 354
  The Products of the South African Alkali, Ltd. ... 356

Notes and News.

More Trouble in July. If the Capetown rumour be correct that the Government has shelved the Riotous Assemblies and Trade Union Bills, the fact only goes to show that the policy of the Government on Labour questions is relapsing into vacillation and weakness. In several directions of late the Government has displayed symptoms of returning to its former futile and disastrous policy of conciliating the Labour people by foolish concessions, and the result of such methods is bound to be trouble. Indeed, so far are the leaders of Labour from being satisfied, that it is an open secret in Labour circles that July next is to see something big in the way of a sudden, unexpected and concerted strike that will display the solidarity of Labour as nothing else can. To deny this is part of the game, and it is almost inconceivable that after what the place has gone through, Labour leaders should still be found hair-brained enough to advocate this form of madness. The fact that Messrs. Creswell and Wybergh will be out of the country at that time is pointed to as conclusive proof that no trouble is expected. To our mind that proves nothing beyond the recognition by the leaders of the "direct action" party that the presence of Messrs. Creswell and Wybergh may not be much help to them in a crisis.

* * * *

Anglo-French Exploration Year. The twenty-fourth ordinary general meeting of the Anglo-French Exploration Company, Ltd., was held in London recently, when the shareholders were given the reasons for the passing of the dividend. Six per cent. only was paid in 1912 and nothing in 1911. Since 1905—a period of nine years—36 per cent. has been paid, or an average of 4 per cent. The Anglo-French Exploration had 145,000 Van Ryn Deep shares at the end of December, 1912. These shares doubled in value during 1913, and the Anglo-French people have sold the bulk of their holding. They may be justified by results, but on the official facts they appear to have made a costly mistake.

* * * *

A New Dump Dust Laying Device. The Rand is indebted to Messrs. F. J. Trump, manager of the Ferreira Deep, and Mr. F. Wartenweiler, assistant consulting metallurgist of the Rand Mines, Ltd., for an invention that promises to prove a veritable boon and blessing. It is notorious that the sands on the dumps, particularly those most recently distributed, resist all attempts to give them a fixity and "sticking power" that will prevent every wind from blowing them over town and reef. Various devices have been introduced, notably that of Mr. E. H. Johnson at the East Rand, and of Mr. S. H. Pearce at the Crown Mines. Quite the best of them all, however, because capable of general application, is the idea of Messrs. Trump and Wartenweiler. This depends on the hydroscopic properties of ordinary salt, and consists in the mixing of salt with slime prior to distributing it over the dump. It is found that the mixture of salt serves to attract and retain even in this dry atmosphere sufficient moisture to keep the coating of the dump always damp enough to prevent the formation of fine dry sand and its distribution by the wind. It is understood that the Corner House people are highly satisfied with the results already obtained from the use of the mixture.

* * * *

The Central Mining Report. As befits the multiplicity of interests covered, the annual report of the Central Mining and Investment Corporation, Ltd., is a long and informative document. Mr. H. F. Marriott contributes his usual valuable review of Rand mining conditions in the year, and his remarks cover all the big controversial questions of the period. The report shows a net profit of £417,393, which compares with £319,954 for the previous year. Unfortunately, however, this satisfactory profit is not available for distribution, owing to the Corporation's holdings having been seriously affected by the continued state of unrest in Europe and other parts of the world during the greater part of the year, as well as by industrial troubles in South Africa and the consequent shortage of native labour. It has been found necessary to write off in respect of shares, interests and investments no less than £555,275, and to add £50,000 to depreciation reserve, thus bringing this account up to £500,000. In order to make these provisions, the reserve fund of £140,000 has been appropriated, and the amount carried forward to 1914 is £24,315 as against £72,198 a year ago. The position of the corporation as regards cash resources and high-class investments continues to be one of great strength, its principal holdings having undergone no important changes during the year. Satisfactory dividends were paid by the various Transvaal mining companies associated with the corporation, the aggregate amount of dividends declared for 1913 being considerably in excess of that for 1912, although owing to the strike the actual value of the gold won was less than in the previous year.

* * * *

The Coerz Report.

The annual report of Messrs. A. Goerz & Co., Ltd., reflects the prevailing depression in mining enterprises. The company, it will be remembered, was formed in 1897, and paid dividends until 1904, when 15 per cent. was declared. In 1909 the shareholders received 10 per cent., but nothing since. The issued capital of the company is £1,400,000, and the investments, based upon market prices or upon the directors' valuation where no market price exists, were worth £879,411, or nearly £500,000 under the balance sheet figure. Quotations, of course, have fallen away to an alarming extent. The investments are worth £880,000 approximately, but their earning power in 1913 was under £20,000. The most remunerative companies in which the company is interested are the South-West Africa, Otavi and May Consolidated. The South African properties have proved disappointing, with the exception of the Geduld and Modderfontein Deep Levels, which are now the most promising holdings. The report refers at length to the difficulties experienced on the Rand. The directors have recently exploited Mexico and took up the La Fe mine, for which £275,000 has been provided. The ore reserves are estimated at 192,410 tons, but at the fourth level developments have been disappointing. A. Goerz & Co. also took an interest in the San Francisco Mines of Mexico, whose property has been shut down owing to the revolution. Not many years ago A. Goerz shares were valued at $3\frac{3}{8}$, and they are now 8s. 3d. In the 1910 balance sheet the cash assets in excess of liabilities were £603,174, but at the end of 1911 they had been reduced to £252,722. The current report says that the assets exceed the liabilities by £154,091.

* * * *

Native Mine Workers and Insubordination.

Some important statements regarding the behaviour of natives in the Witwatersrand mines were made to a representative of this paper during the week by an official high in the service of one of the controlling mining houses. Our informant stated that natives generally were most insolent and insubordinate at the present time, and that miners were practically powerless to control them. The official in question declared that on many of the mines industrial discipline had sunk to such a low level that it was practically non-existent. For this state of affairs he thought that the Government Native Department was largely to blame. Underground coloured workers, he continued, were only too ready to interpret any emphatic command as an assault and were sure of an ultra-sympathetic hearing by officials of the Native Affairs Department. This Department, went on our informant, pampered natives to a ridiculous degree and seriously undermined the authority of the mine officials. He contended that this lack of industrial discipline, which resulted in gross inefficiency and great loss, was one of the principal hindrances to progress on the Witwatersrand to-day.

The Wit. Deep's Year.

Mr. W. H. Dawe, who presided at the annual meeting of the Witwatersrand Deep, Ltd., at the end of last week, had a very satisfactory record to place before shareholders. In fact, despite the labour difficulties, with which last year's work was attended, the Witwatersrand Deep registered improvements in every direction—and moreover very substantial improvements. In the first instance the ore reserves were increased by 173,700 tons to 1,660,000 tons, the value at December 31st, 1913, being practically the same as at December 31st, 1912. As to productive operations, the ore milled was 67,230 tons greater, the total yield larger by £119,382, the yield per ton better by nearly a shilling, and the profit per ton by 2s. 7d., whilst the total profit was £303,228 as compared with £205,007 in 1912, an improvement of £98,221. Moreover, this is no temporary phase of prosperity, for Mr. D. Wilkinson, the consulting engineer, states that the outlook at the mine is now more satisfactory than has been the case for the last three years, and, "given sufficient native labour, the profits earned during 1914 should be considerably higher than during the past year." To the highly satisfactory state of affairs now prevailing at this mine the sand-filling operations that have been carried out there on a large scale have contributed in no small degree. Sand-filling, quite apart from making the worked-out areas much safer and reducing the pressure on the lower workings, has assisted materially in the extraction of good ore from pillars in the old sections of the mine. The milling capacity, it is important to note, has been brought up to 52,000 tons per long month.

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The Cons. Langlaagte-Victoria Falls Case.

One of the most important law cases affecting the mining industry ever fought out in a Johannesburg Court was brought to a conclusion a few days ago, when Mr. Justice Ward delivered judgment in the action brought by the Consolidated Langlaagte Mines against the Victoria Falls and Transvaal Power Company. The claim was for damages for alleged breach of contract under agreements for the supply of electricity. Mr. Justice Ward gave judgment for the plaintiffs, and it is understood that the total amount of the damages will be £29,123. The hearing of the case was very naturally characterised by evidence of a highly technical nature. His Lordship, in his judgment, said that the damages claimed were in respect of 1,200 kilowatts ordered on the 2nd of February. His Lordship found for the plaintiffs as follows: (1) Loss in extraction, £4,233; (2) deferred profits, £25,750; (3) extra cost in development, £4,344 19s.; (4) extra cost of shaft sinking, £1,941; total, £36,268 19s. From this must be deducted the present value of £25,750 (deferred profits) at 6 per cent. payable in twenty-two years. Judgment was accordingly given for the amount so to be ascertained and costs, and, as already stated, it is understood that the total amount of the damages will be £29,123.

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1913 at New Kleinfontein.

The New Kleinfontein mine came into unfortunate notoriety last year on account of being the property at which the labour troubles of July had their origin. Mr. W. Dalrymple, who presided at the annual meeting on Wednesday morning, made very little reference to that trouble, but in commenting on the profit earned last year, which was £231,524 as against £240,651 in 1912, he remarked that "when the difficulties of the past year are taken into account, I think you will agree with me that we have been able to show, on the whole, a satisfactory result from the company's operations." The ore reserves of the mine at December 31st, 1913, he stated, on re-estimation show a considerable increase in tonnage but a slight decrease in value, the figures for 1913 being 1,345,216 tons of a milling value of 7·53 dwts. over a width of 48·29 inches. The Chairman stated that owing to the increasing depth of the Kleinfontein workings it has become necessary to establish a definite current of ventilation throughout the mines, and he went on to say that the management would do all in its power to bring about safe and clean conditions in the mine. Naturally some extended reference was made in the speech to the amalgamation of the New Kleinfontein, Apex and Benoni mines, and Mr. Dalrymple stated of the schemes of expansion which formed one of the considerations in the consolidation project: "I trust that at no distant date we may be able to obtain the money necessary at reasonable terms, so that no time may be lost in reaching the profit stage from your recent purchases. If we had, say, £150,000 to-day, and given industrial peace, with the necessary unskilled labour, we could reasonably promise that your ore reduction would be increased to at least 75,000 tons per month within a period of twelve months."

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The Secretary for Mines' Report.

There is a great deal of food for discussion in Mr. Warington Smyth's essay on "grievances" in his annual report for 1913. The Mines Department people are never happier than when engaged in giving good advice to the mining industry, and Mr. Warington Smyth airily disposes of all Rand labour problems, indeed of all modern industrial problems with the ease and graceful fluency of the born *doctrinaire*. His reading of the industrial unrest of last year is that it was due to (a) the tactless attitude of the employers towards the Industrial Disputes Act, (b) the phthisis evil, (c) the changes on the mines, (d) the contract system, and (e) "debatable economic teachings." To our mind, the diagnosis errs in not giving a foremost place to the successful efforts of those whose business it was to drive a wedge between employers and employed. In blaming the employers for their attitude towards the Disputes Act, Mr. Smyth must remember that they acted legally within their rights, and probably exactly as the men would have acted had it suited them. The part played by the preaching of "debatable economic teachings," a very mild euphemism for the most criminal and subversive anarchist doctrines, is rightly condemned by Mr. Smyth, but his remarks on changes on mines and the contract system call for some comment. By a coincidence, Mr. Archbold, the Deputy Inspector of Mines at Krugersdorp, in his lecture on "Accidents" this week, attributed the high percentage of Rand accidents to these, among other causes. It will be remembered also that they have long been objects of condemnation in the annual reports of the Mines Department. Now as regards the contract system, we believe the industry could very well do without it. The engineers upon whose advice it has been retained are few of them here to-day, and we have hopes that, in their absence, the industry will unanimously decide to do away with the system. A general and concerted effort to dispense with it could at any rate be made. The question of changes on mines is more involved. The men themselves and the local circumstances are undoubtedly more to blame for it than the managements. A Rand mining house recently tried an interesting experiment to probe the cause of the changes on their mines. They transferred a manager of one of their mines on the Rand to an "outside" mine, having previously kept a strict account of all the changes under his management. Then a comparison was instituted between the number of changes under his management over a period on the "outside" mine. The result showed conclusively that the personality of the manager in no way affected the matter. The "outside" mine had practically no changes when compared with the high average on the Rand. The moral is obvious. Both Mr. Smyth and Mr. Archbold fail to make allowances for all the circumstances that go to create this evil. Then Mr. Archbold talks glibly of the evils of "speeding up." But he does not define the term, which, as a fact, had its origin and application under entirely different circumstances in the English coal miners' agitation for shorter hours. If "speeding up" means increasing the efficiency and output per man, there is certainly lots of room for it on the Rand; and instead of causing accidents, is likely to lessen them. The fault of all these lectures from the Mines Department is their unquestioning acceptance and adoption of the parrot-cries and *clichés* of the Labour orators, which is demonstrably both unscientific and unfair when dealing with the highly specialized and complex conditions and processes of modern industry.

TOPICS OF THE WEEK.

THE MINING EXHIBITION.

The most successful mining exhibition ever held on the Rand is undoubtedly that now open at the Drill Hall. The undertaking has been organized by the Chemical, Metallurgical and Mining Society, and it is the third and biggest of the series promoted by that body. The very proximity of the industry to the town has, perhaps, militated against the success of a mining exhibition in Johannesburg. People who live within sight and sound of the mines do not need to be reminded of the familiar scenes and processes of everyday industry. Quite early in the history of these undertakings it was found, consequently, that something more than mere illustrations of mining work were wanted to attract visitors and invest the whole with popular interest. Gradually, therefore, the original aims and scope of the scheme have broadened out to include new features of industries and activities connected with, or subsidiary to, the business of mining, until to-day the last-named is less directly represented than ever. Instead we have "Safety First" exhibits, "First Aid" appliances, and the multitudinous products of the local inventor's genius almost monopolizing the space of the Exhibition. Next to these the most important and most welcome feature is the commendable display of local manufactures. Notable among these are the steel products of Vereeniging and the alkalies of the Zoutpan Company.

Doubtless, however, the chief value of the Exhibition lies in its educational and humanitarian aspects. As Mr. Alex. Richardson, President of the Chemical, Metallurgical and Mining Society, said in his speech at the opening, the Society had always taken an active interest in matters educational and humanitarian, and these exhibitions were the outcome of that interest. He showed that the educational value of such a mining exhibition as that lay in the opportunity it afforded members of the public to come and inspect mining appliances and models, to attend lectures and demonstrations given by experts, who had kindly volunteered their services, and, generally, to bring themselves into touch with mining and its many problems. The humanitarian aspect was one to which the Society had always been keenly attracted. He recalled that many years ago the Society did some notable pioneer work in reference to miners' phthisis and in connection with safety measures in mining, and was successful in arousing a very general interest in matters relating to the amelioration of underground conditions, and that it still kept its ideals alive was shown by its recently greatly assisting in the formation of the South African Red Cross Society. He dwelt on the fact that the dissemination of knowledge and the protection of human life were the two objects chiefly aimed at, and, in addition to these, every encouragement was given to the display of the raw mineral products of the country, and every facility was afforded the small man, financially speaking, to bring his ideas and inventions to the general notice. Mr. Richardson's claims were fully justified by the number and variety of the inventions on show, the interesting, if not over-plentiful, examples of local resources, and above all by the record attendances of the public during the week.

To our mind, the "Safety First" section of the Exhibition is easily the most interesting and important. A supplement in this issue deals very fully with the principal exhibits in this section, describes the winning devices in the competitions organized by the "Safety First" Committee of the Rand Mutual Assurance Co., Ltd., and gives an account of the history and origin of the idea on the Rand. That the industry is now keenly appreciative of the significance of the new movement, there is a multiplicity of evidence to show. Not the least important was the tribute paid to it by Mr. E. A. Wallers, the President of the Chamber of Mines, in his speech at the opening of the Exhibition on Tuesday. Alluding to the "Safety First" campaign in the course of his speech, Mr. E. A. Wallers said it appealed very greatly to him. He added that though employers had always had the greatest concern for the safety and welfare of employees, it was possibly to be regretted that the movement was not initiated in its present form earlier; but those who administered the industry and the workers should now take it up. He declared it was impossible for the movement to be successful without the co-operation of the men. He thought that the "Safety First" Committee was a strong one, and it had the advice and sympathy of the Government Mining Engineer and officials. In conclusion Mr. Wallers heartily congratulated the Society on the success that had attended its enterprise. In offering our felicitations to Mr. Richardson, Mr. Cullen, and Mr. Rowland, we would like to include the Managing Secretary of the Rand Mutual Assurance Co., Mr. J. F. Bilbrough, its Legal Adviser, Mr. Barry, and the Chairman of the "Safety First" Committee of that body, Mr. H. Neuhaus, to whose exertions so much of the success of the Exhibition is due.

THE GOVERNMENT AND THE FUTURE OF THE FAR EASTERN RAND.

In these days of unrelieved gloom, when returning Labour troubles cast their shadows athwart the Rand, it is more than usually gratifying to be the bearers of some good tidings. The fact is we have reason to believe that the Government is now seriously engaged on an attractive scheme for throwing open for work the extensive areas it possesses on the Far East Rand. Our readers will remember that we have not ceased since the failure of the last Government leasing scheme, to agitate for the framing of more attractive terms for investment in the great undeveloped areas of that district. That demand, it would seem, has not been without effect; and the Government is now alive to the vital necessity for offering such terms as will secure the exploitation of those areas. Oddly enough, Mr. Reyersbach spoke very explicitly on the subject at the Central Mining meeting in London last week. According to the cables, he said: "I believe the extension of the industry lies in the Far East Rand, where the Government is the most important owner of property. I suggest that the Union Government will have seriously to consider whether under existing legislation the desired extension can be obtained, or whether more attractive terms are necessary." This, we may take it, is a gentle hint from Mr. Reyersbach to the Government that it will have to amend its precious sliding scale leasing scheme if it is to get investors to put up the money to open up the Far East Rand. And by a curious coincidence, General Smuts, in replying to the debate on the Budget, showed that he had been thinking of the same thing, and as the result of his thought, was in a position to make a very encouraging pronouncement. He emphasized the fact that the disquieting evidence given by the Chamber of Mines before the Economic Commission, referred only to the present producing mines, and did not refer to those other large areas of the Rand which were at present not being worked. The real future of the mining industry was, he said, largely in the far east of the Reef. There were very large areas contained in the Main Reef series. In some places boreholes had been put down and the Main Reef had been found. Four-fifths of these areas in the far east belonged to the State, which had prescribed "very rigid and difficult conditions for the participation in any mining venture in these areas." The State claimed a very substantial share of the profits. There were thousands and thousands of claims still further east which could be brought into operation. The day would come when those areas would be worked. It was Main Reef, and, if not so good as in some of the present mines, it might be better in other places. Proceeding, General Smuts pointed out that these would be worked and the State would get more than they got from the present producing mines. All this had to be taken into consideration when people speculated about the life of the Rand. The Chamber of Mines evidence did not refer to those enormous areas that were still awaiting development and on which with the present stringency of the money market large expenditure was not likely to be made at present. He did not view the prospects of the mining industry with alarm; all those areas would have to be worked *and he thought it would be good for the Government not to be long before making a start with some of them. He hoped it would be possible to make a start in time to overtake the wastage in the present producing mines.* The italics are ours. This last statement, if it means anything, means that our original information is correct and that the Government has already begun to prepare a scheme of a more attractive nature than any hitherto framed to secure capital for the Far East. The news, as we have already said, is quite the most reassuring the Rand has heard for many a day. There are 88,000 undeveloped claims on the Far East. This might mean eighty mines of 1,000 claims, each estimated to require up to a million sterling for development and equipment—or a possible total capital expenditure of £88,000,000! We can well sympathize with the long-suffering business community in their cry, "Oh, let it come soon!"

THE NEW WORKMEN'S COMPENSATION BILL.

The new Workmen's Compensation Bill for the whole Union has now reached the Committee stage in the Assembly. The Bill represents an honest effort to cover the wide and complicated field of modern industry, notably, of course, mining in all its branches. Criticism of the measure in the House of Assembly mainly centred in the fact that the farming community was exempt from its provisions. The Government did not attempt to offer an excuse for this anomaly. A feature of the Bill is its extention to cover accidents to natives and coloured workers. The maximum wage of those affected by the measure remains as in the present Transvaal Act at £500 per annum. In the course of the speech in which he introduced the Bill, the Minister of Public Works explained that the underlying principle was that it was necessary for the law to throw its protecting wings over the poor and helpless people who in many cases were least able to protect themselves, and least able to take advantage of the laws passed for their benefit. The position at the present time was: In the Free State a common law existed. In Natal there was an Employers' Liability Act on the Statute Book, which widened the scope of the employers' liability, but did not provide any special form of procedure. In the Cape and the Transvaal there was an Act in each Province dealing specially with that matter. Proceeding, the Minister said that the Bill was founded on the Acts already in force, but it had been taken also from legislation in other countries on the subject. The Bill mainly followed as regards the amount of compensation the provisions of the Transvaal Statute. The claim originated with the workman in event of any personal injury arising to him by reason of an accident which took place in the course of or arising out of his employment, and a similar claim could be maintained by the dependents of a workman who was killed or who afterwards died as the result of such an injury. But it did not make an employer liable for a workman who might have heart disease and who might drop down dead in the course of his work. It must necessarily be the result of an injury received in an accident occurring in the course of the employment, and no compensation whatever was to be granted to the workman or the deceased workman's representatives if he had been guilty of serious wilful misconduct. That had been defined to include drunkenness. It had also been found to be a contravention of any law or regulation made by lawful authorities for the protection of life and limb in a factory or mine. It was also defined as being any other act or omission which might be declared to be serious or wilful misconduct. It had been held in the Transvaal and also other places that a workman who tampered with machinery against the express instructions exhibited for his guidance, say, in the case of one who oiled machinery against regulations while the machine was in motion, had committed an act of serious and wilful misconduct. Without going into the matter fully (the Minister proceeded), the principle was that, where a workman wilfully committed an act which was held by a competent Court to fall within those words, then his claim for compensation fell to the ground. The important change brought about by the Compensation Acts in South Africa and continued, was that it was not necessary for the workman to prove negligence on the part of the employer or on the part of a fellow-workman. These represent the main points in the Bill before it went into the Committee stage. How it will emerge from it remains to be seen.

INDIVIDUAL MINES AND IMPROVING RETURNS.

How Profits Have Increased and Expenses Declined in the Current Year—Six Typical Concerns Considered.

WITH the improvement in the native labour position there has very naturally been a contemporaneous advance in the profit earnings of the great majority of Rand mines. It is particularly noticeable that since the commencement of the current year numbers of the larger mines of the Main Reef series have succeeded in effecting substantial reductions in working costs, and have shown steady advancement in profit earning. Were it not for the prevailing acute depression which seems indeed to stifle the light out of any bright spots that may appear in our industrial firmament, much more heed would certainly be taken of the marked improvement which has taken place lately in the affairs of a large number of the leading mines. As it is, the local public and oversea investors appear to be wholly apathetic to any advances or improvements. Nevertheless it may be of interest to examine the returns of a few of our improving mines since the commencement of this year, and to show what steady advances in profit earning have been recorded largely through the instrumentality of more economical working expenditure. In the following list a few companies have been picked out haphazard. These companies own mines from one end of the Reef to the other, and are representative of very varying conditions. In each instance a steady rise in profits, accompanied by a decrease in working expenditure, is to be observed. January operations were, of course, affected by the "strike" in the middle of that month, which, although abortive, resulted in considerable disorganisation. Improvement in the native labour supply in February and March is reflected in the figures and the maintenance of improvement in April resulted in a large number of companies recording still better outputs, still lower working costs, and still larger profits, despite the fact that there was one less working day than in March. An examination of the figures for the half-dozen companies here appended should repay some study, if only to indicate that the majority of the mines of the Witwatersrand are not, after all, such declining ventures as some people imagine them to be.

GELDENHUIS DEEP.

	Tons.	Revenue.	Costs per ton.	Profit.
January	43,700	£64,540	24/11	£8,786
February	41,800	61,074	24/7	8,373
March	48,000	66,367	23/3	9,552
April	48,000	67,683	23/3	11,000

RANDFONTEIN CENTRAL.

	Tons.	Revenue.	Costs per ton.	Profit.
January	166,306	£201,007	18/7	£44,527
February	173,178	214,323	18/1	55,017
March	207,269	246,589	16/8	71,004
April	209,596	243,353	16/6	71,277

VAN RYN DEEP.

	Tons.	Revenue.	Costs per ton.	Profit.
January	30,340	£50,455	20/3	£19,719
February	34,200	56,321	18/4	24,929
March	39,200	64,757	17/11	29,618
April	40,000	66,260	17/1	32,007

VILLAGE DEEP.

	Tons.	Revenue.	Costs per ton.	Profit.
January	42,000	£63,707	22/3	£16,343
February	43,100	58,092	19/0	16,486
March	52,000	70,504	17/2	25,079
April	50,300	70,262	16/9	27,158

WEST RAND CONSOLIDATED.

	Tons.	Revenue.	Costs per ton.	Profit.
January	16,550	£20,661	26/10	*£1,426
February	22,000	26,119	21/0	3,127
March	24,000	30,490	20/11	5,450
April	26,100	33,684	19/11	7,659

* Loss.

WOLHUTER.

	Tons.	Revenue.	Costs per ton.	Profit.
January	28,300	£37,142	18/5	£10,617
February	29,400	37,151	17/6	11,007
March	34,100	42,634	16/6	14,022
April	33,000	41,739	16/7	14,220

PIETERSBURG GOLDFIELDS ACTIVITY.

Proposal to Deproclaim Rich Area—Protest to Government.

THE goldfields to the south of Pietersburg are coming in for a great deal of attention at the present moment. One of the causes is the splendid results which have rewarded Mr. Eklund for his patient and determined development of the Freda Mine. This property has been making a good return recently, and a company is now in process of formation to take over the mine, says the *Zoutpansberg Review*. The capital, £10,000, has already been subscribed locally, but a number of details have to be seen to before the flotation is completed. The reef upon which Mr. Eklund has been working runs almost due east and west. To the west, on the farm Zand River No. 139, the ground is scarred and broken with trenches and shafts, most of which were made by the prospectors long ago—the farm was proclaimed nearly fifty years since—but many of the workings are new. Within the last few weeks discoveries have been made which seem to prove conclusively a great future for this area. Mr. Ezzey, Pietersburg, pegged a number of claims in a line due west of the Freda, but on Zand River in December last. Three weeks ago what is judged by experts to be the main reef was struck, and an [illegible] sample yielded, on assay, twelve dwts. The chief shaft on Mr. Ezzey's property has now a depth of thirty feet, and ore is visible which is judged to be much more valuable than that which was first assayed. Several cuttings due west of this shaft revealed the reef, and it seems to be proved that it runs along the south side of the kopjes. A good many claims have been pegged by others on the farm, but now, like a bolt from the blue, has come a notice by the Mines Department of intention to deproclaim the farm as a public digging. This move is inexplicable. Certainly the farm has been a proclaimed digging for a long period, but it is being asked, "Why deproclaim it now just when the efforts of many years are likely to be crowned with success?" Deproclamation will not, of course, affect the present claim holders, except to prevent them pegging additional claims which may be very necessary for the adequate development of their properties, but it will put an end to the pegging of fresh claims, and so retard the progress of the district. It may be mentioned that the reef that runs through the Freda property is that from which good returns are being got by Messrs. Henderson, and the fact that Mr. Lewis, on the farm which it is proposed to deproclaim, has found gold-bearing rock about a thousand yards north of the reef discovered in Mr. Ezzey's claims indicates that there are two distinct reefs in the Roodepoort hills, running parallel. It will be a great blow to Pietersburg if the Government proceeds with their intention to deproclaim the farm Zand River.

SHAFT-SINKING AT DAGGAFONTEIN.

An Ingenious Baling Device—Water Hampers Operations.

At the Daggafontein Gold Mining Company's property on the extreme south-eastern Witwatersrand sinking is proceeding as rapidly as circumstances will permit, but operations have of late been much hampered by the presence of hard dyke rock and the inflow of large quantities of water. An ingenious vacuum baling tank is now being installed to bale out water from the shaft. For the following particulars of this device, we are indebted to Mr. J. M. Martyn, the manager of the Daggafontein G. M. Co. An air-pump for creating a vacuum is being placed 500 feet above the bottom of the shaft. This air-pump is to be driven by a Pelton wheel, and the head of water is 500 feet, the displacement of air in the pipes being equal in area to the displacement of air in the tank. Four-inch diameter pipes are carried down to within 10 feet of the shaft bottom; at the end of the 4-inch pipes a 40 feet length of flexible hose is attached. A four-inch diameter pipe is carried up to within an inch of the tank top, the lower end of the pipe coming through the side of the tank, which carries a vacuum brake connection coupling. A leather-faced valve operates on a seat connected to a valve spindle and fitted with a ball-joint at the top of the valve, the spindle working through guides. The seat, on which the valve operates is raised five inches above the bottom of the tank, with turned face to prevent leakage, the seat being bolted to tank bottom and the top-heads of bolts counter-sunk. An eight-inch diameter valve is connected to the side of the tank and is operated at the top of the tank, the spindle of the valve passing through a stuffing gland; this valve is fixed in the tank to provide for emptying the tank at the side if required. An air-tap, one-inch diameter, is fixed on the top of the tank to admit air at atmospheric pressure the moment the tank is being emptied. Fixed on the side of the tank is a gauge glass to indicate when the tank is full, the gauge glass is protected by ribs of iron. A man-door is fixed on the centre of the tank to admit of repairs to valves, etc. A perforated plate with wire mesh cover is fixed over the valve orifice at the bottom of the tank to prevent small stones from getting in between valve face and seat. The end of the flexible hose leading down from the vacuum pump is fitted with a corresponding half vacuum brake coupling with a stop-cock immediately above. When the tank arrives at the bottom of shaft it is guided into the water sump, the eight-inch diameter spill valve and one-inch air tap at top of tank being closed. The vacuum brake coupling at the end of flexible hose and the corresponding half on the tank are instantly attached and the stop-cock opened. The air in the tank being immediately exhausted, the tank fills in 15 seconds through the twelve-inch valve at the bottom of the tank. The stop-cock is shut when the gauge glass indicates that the tank is full, and the vacuum couplings are detached when the tank is free to ascend the shaft.

ANNUAL REPORT OF THE SECRETARY FOR MINES AND INDUSTRIES.

Mr. H. Warington Smyth Reviews in Detail the Labour Troubles of Last Year, and Attempts to Analyse the Causes.

An interesting Blue Book was published this week, containing the annual report for 1913 of the Secretary for Mines and Industries (Mr. H. Warington Smyth) on the labour and industries section of his Department. Under the heading "grievances" he discusses the real causes underlying the industrial unrest which characterised last year. He discards the theories that these can be explained satisfactorily by the growth of Syndicalist or Socialist views, or are wholly attributed to the exciting language used by a certain number of Labour speakers. The first cause assigned is in connection with the Disputes Board which investigated the conditions of the new form of underground contract on the mines along the Reef. The position of the companies in refusing to be bound by the terms of the award might be defended on legal grounds, but, says the report, "when dealing with men strict logic may always with advantage be tempered with a little tact and sympathy, and it is an open cause of bitter complaint how little of these qualities are admitted into their affairs by the directors of companies." After remarking that probably an unsympathetic barrier rose between the Transvaal Miners' Association and the mining houses owing to companies not being prepared to concede the principle of a fixed minimum wage, the report proceeds: "But there is not the least doubt that many men felt very keenly what they described as the contempt with which they had been treated by the omission of the companies to carry out any one recommendation of the Disputes Board."

INDUSTRIAL DISPUTES ACT

Another complaint in the same connection was directed more especially to the machinery of the Industrial Disputes Act. The difficulties experienced by trade unions in making application in the form required under the Act gave a feeling to a number of men that the Act was an impossible one and its machinery too difficult for them to understand, and this was at the bottom of the outcry that the Act should not be regarded with respect and could be flouted by the men. The next principal cause, in the opinion of Mr. Smyth, of a large amount of the unrest on the mines has been the realisation of the prevalence of miners' phthisis. A certain feeling of recklessness must be engendered in men who find themselves suffering from a disease of this nature. Another grave cause for discontent which has been frequently referred to in the annual reports of the Department has long been the constant changes on the mines. These changes may be said to have had a [illegible] effect. The cause has largely been with the mining companies, who have changed directors, officials and staffs with a rapidity and completeness which has had its effect not only on the social conditions of the mines but also on working costs and working conditions." If higher ranks are changed in this manner change must inevitably follow in the lower ranks. A mine manager brings his own mine captain, and so on, in the lower ranks. Nevertheless, it is not to be denied (says the report) that the men themselves, by their own conduct and preferences, often contribute in no small degree to the prevailing unrest. Mr. Smyth regards it as typical of the position that men refused to consider a proposal to eliminate the clause in their contract with reference to twenty four hours' notice on either side. "Few can under these circumstances regard their mine with any just sense of pride or look to a future bound up in its future. The best efficiency which is the aim of all cannot be realised under such circumstances."

LOWER WORKING COSTS.

"Lower working costs and still lower are always being clamoured for, and must be realised if the Rand is to contribute its full and legitimate share to the prosperity of South Africa. But the best efficiency cannot be obtained by new officers and workmen always new to one another." Another prolific source of discontent (proceeds the report) is without doubt the underground contract system. Theoretically, no doubt, payment by piecework, or by measurement, which is payment by results, should be the best method in the interests of efficiency and of work done, but practically the human factor must be remembered. It is human nature to want a certain amount ensured to the individual for his work, whether he has good luck or bad. He should not be faced with the constant uncertainty and anxiety due to a possibility of coming out in debt or with scarcely sufficient to meet his rent and his children's food at the end of the month. Surely every person, whatever his walk of life, who is in receipt of a salary or competence, must recognise the justice of allowing the working man a definite payment. All that is claimed is that every individual should be entitled to a fair minimum—not necessarily uniform—national wage for all persons, but that every mine or undertaking should pay its underground or other employes such amount per day as, having regard to the hardness of the rock, condition of [illegible] or other factors affecting the cost of production, it can afford economically to pay plus certain possible variation depending on results achieved." Amongst other objections urged against the underground contract system are lower efficiency in all other mining work except rock breaking, in regard to which it is arguable which system is the best. In all such matters as timbering, safety packing, and general mining, many mine managers, and other authorities, hold a strong opinion that the contractor is less efficient than the day's pay man.

DEBATABLE TEACHINGS.

Among other causes of unrest the report particularly mentions "the debatable teachings in regard to economic matters which seem to emanate from various sources in the country." It instances doctrines that the interests of capital and labour are absolutely opposed, and that the country would be better without capitalists or investors. As to the first of these, Mr. Smyth remarks that the arguments in support of the statement are not often put forward. As to the latter, those who propose to do without capital do not as a rule examine how necessary funds are to be raised for developing the big properties on the East Rand. Even if the Government should undertake this expenditure they could only do so at a price. And again the investor, who belongs to the capitalistic class, must come in for consideration. Mr. Smyth suggests that probably an immense amount of good would be done and considerable danger to the State be removed by some method of teaching some of the fundamental economic principles which underlie the modern monetary system of our civilisation. Another of the causes of unrest, which operated specially in Natal, is in Mr. Smyth's opinion the long hours which have been worked by white men, both engine-drivers and underground men, in collieries. He considers the colliery owners have done their best to be liberal, and remarks that the coal industry has had an uphill struggle in Natal, but adds that it seems a pity that the statement in regard to intentions to improve pay and hours was delayed by the companies until the strike occurred. "It must be admitted that in the presentation of complaints in all the above matters it has frequently been the case that a considerable amount of irritability arising from ambition to see immediate results was shown. The man who is suffering from what he feels to be unfairness, hardship, or wrongful conditions of life cannot be expected always to present his case with fairness to the other side or with due consideration of the difficulties of righting his grievances. Thus it comes about that in much of the talk in regard to legitimate grievances there has been mixed a good deal of harder talk about industrial war, a war of classes, etc., and reasonable trade unionism has been merged by many more excitable temperaments into methods of syndicalism. Anxiety to see some result of their complaints and the excited language of some of the leaders to whom they look, are often causes of sober thinking men being led into actions which they regret at other times."

TRADE UNION VIEWS.

The report proceeds, under the head, "Some trade union views," to present in some detail the views of moderate trades unionists and the doctrines of syndicalism as lately developed in this country. "Listening to arguments of the two schools of trade unionism briefly referred to, it is natural (says Mr. Smyth) to enquire to what extent either of them may anticipate success in this country, or may be suited to its special conditions. How far public opinion of the country is prepared to approve of Continental syndicalism is a question which arose often to the mind in 1913, and which was answered at the time in many different ways, but it is probable that conservatism and respect for authority of a large proportion of the country population has been underrated. In discussing these matters with trades unionists of both kinds, these considerations have been frequently faced by many of them, and while the ultimate chances of the prevalence of the second class of views above referred to were, as far as one could gather, generally thought to be small, scope for what may be called the old-fashioned English trade union views appears to be a great one in South Africa, because it does not raise any of these difficult questions which inevitably affect the carrying out of the syndicalist school of thought and the eruptive methods it generally advocates."

COLOURED UNSKILLED WORKMEN.

The report then refers to the presence of coloured unskilled workmen as the outstanding feature which differentiates all labour questions in this country from those known in Europe, the United States, or Australasia. In Mr. Smyth's opinion "the chances of success of the general strike appear to be less in South Africa than in many other countries. In certain respects the country is undoubtedly peculiarly susceptible to the operation of such a method of attack as the general strike. But, it is asked, after the general strike, What? Authorities differ at present so widely among themselves as to what the immediate methods and ultimate ideals of the anti-capitalist movement should be that no clear-cut schemes of a social reconstructed organisation have yet been evolved." Most students of the subject, except the majority of French writers, but including M. Sorel, seem to be agreed that force itself will never bring about real development on lines wished for. Under such circumstances, Mr. Smyth urges that "the truest help which the State can render to industrial reform is by insistence on the preservation of peace in the community. The industrial revolution of the world, if it is to come, must be a gradual evolution." The report proceeds to deal with the events of the year, referring especially to actual incidents of the June, July, and January strikes, but adding little fresh light. In the chapter on unemployment, the report suggests that to deal with the permanently indigent white class Parliament should put aside a sum of money for commencing an extensive experiment on the lines suggested in the report of the Indigency Commission in the way of labour colonies. The report strongly urges the institution of compulsory labour colonies for the idle and vagrant class, which would result in clearing the ground for dealing more easily with the legitimate unemployed. Under the heading of "Industrial," the report says in the draft legislation prepared for the 1914 session provision was made for the supply of statistics by employers and factory owners regarding capital invested, value of plant, value of output, and details of labour employment, but in the meantime it is estimated that forty millions sterling are invested in factories and industrial production in South Africa.

MINING MEN AND MATTERS.

Mr. F. P. Rolfe is now managing the Fred Mine, Filabusi, Rhodesia.

* * * *

The next meeting of the South African Institute of Electrical Engineers will be held on Thursday, May 28. Mr. R. H. Gould will read a paper on "Mine Signalling Systems."

Messina (Transvaal) Development.

April operations: Mill ran 24·5 days and treated 6,200 tons of ore, equal to nearly 260 tons per day. Only one smelting furnace was running throughout the month and treated 215 tons of middling. Total production was as follows:—Mill concentrate, 1,078·65 tons; average assay value, 38·5 per cent. copper. Smelter matte, 13·50 tons; average assay value, 59·6 per cent. copper. Total, 1,122·15 tons; average assay value, 40 per cent. copper. 170 tons of 10 per cent. copper middling, together with 698 tons from accumulated stock were re-ground and treated during the month by the Huntingdon mill which is included in above. 482 tons middlings were recovered from Wilfley tables; average value, 8 per cent. Lilliput coal mine produced 300 tons of coal during the month. Development footage for month amounted to 334 feet at 6th, 9th, and 10th levels. Slightly smaller output due to one working day less during the month and one smelter furnace being under repair. Concentrates and matte shipped during the month, 915 tons.

Village Deep.

The profit earned by the Village Deep in the quarter ended March 31 was £55,759. Development work: Number of feet driven, sunk and risen, exclusive of stopes, 3,109 feet. The reef disclosures were as follows:—Main Reef Leader: Distance exposed, 1,852 feet; width, 36·7 inches; assay value, 51s. 8d. South Reef: Distance exposed, 189 feet; width, 30·9 inches; assay value, 29s. 0d. Reduction works: Ore received from mine, 154,535 tons; waste sorted out, 10·9 per cent.; tonnage crushed, 137,100 tons; number of stamps operating, 180 stamps; number of tube mills operating, 7 tube mills. Value of ore before crushing (reflected by mill yield and value of pulp):—Mill yield per ton, 19s. 11d.; assay value of pulp, 9s. 1d.; total, 29s. 0d. (The value per ton is calculated at 84s. per fine oz.) Total yield, 45,272 ozs. fine; total yield per ton, 27s. 8d. Although general working conditions were a good deal disorganized during the strike, matters have rapidly re-adjusted themselves, so that the tonnage milled is an improvement over the previous quarter. Development operations are gradually being restricted in view of the very strong position of the ore reserve due to the large amount of advance development that has been done in the past. This reduction will result in a considerable saving of expenditure and at the same time the present strong position will be fully maintained. The saving on this account will counteract the increased charges due to all expenditure on running account at No. 3 shaft being charged to working costs. The sum of £2,465 was expended on construction account, leaving an amount of £21,009 to be expended on account of work authorised. The fourteenth ordinary general meeting of shareholders will be held in the Board Room, the Corner House, Johannesburg, on Wednesday, 3rd June, 1914, at 11.30 a.m.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Fallacy of "Cheap" Labour.

To the Editor, *South African Mining Journal.*

Sir.—In the discussion now going on as to the "Raising of the Colour Bar," both the advocates and the opponents of the proposal assume that to carry it into effect would be of great economic benefit to the mines; and the opponents think that the result would be greatly diminished employment of whites on the Witwatersrand. I think both of these generally accepted conclusions are quite wrong. I will deal with the last contention first. Assuming that the Colour Bar were raised, how many white men could be dispensed with on the Reef? As far as the surface men are concerned (who are about 55 per cent. of the total white complement of the mines), practically none at all. Natives and coloured men are not likely to replace skilled mechanics for many years to come—if at all. Ask any enterprising and successful building contractor in Johannesburg whether he would prefer the kind of employees he can get at the Cape to the sort he actually deals with in Johannesburg with a view to economic work. I think there is little doubt as to his answer. He would take the Johannesburg working force every time. As to the underground men, a large proportion of them come into the same category as the overground men. No one but a lunatic would think of replacing the underground men, shift bosses, timbermen, pipelayers, tracklayers, tramming foremen, lashing superintendents, shaftsinkers, development contractors, and gangers of reclaiming operations by coloured workers. The possibility of substituting coloured gangers for white men is therefore reduced to a field employing about 4,000 men. What reduction could be made in this force? Not a very great one! The advocates of the proposal think that they could employ many more coloured men if they could be legally used to carry out blasting operations, and were permitted to enter the working places first. Well, everyone who knows anything about hand mining knows that, law or no law, the boys are already doing, and have for a very long time been doing, both these things to a great extent. It is doubtful whether 1,500 white men could be replaced by natives or Cape boys on the whole of the Reef, if the whole of the prohibitive provisions of the present law were withdrawn. If that were done, the mines then would very quickly find out that the remaining white supervisors would have to be of a very much better calibre than the average man now employed, and that their wages would have to be raised. There might be many applicants for the remaining jobs, but a much smaller proportion of those applying would be fit for their work. The disputants on both sides who think that the removal of the Colour Bar would lower working costs are simply talking the sort of economic nonsense which passes for commonsense. They are saying in effect that greater efficiency can be obtained by the use of less efficient labour, and that cheap labour by the day is cheap labour by the piece. This kind of people never learns anything from the failures of others. The whole economic experience of the world is against them. Some time back, in the S.A. *Mining Journal*, there were published notes of what is being done in the way of cheap mining in Alaska. Now there is no cheap labour in Alaska, as we understand it. The unskilled labourers, the lashers, trammers and shovellers, get a minimum of about three dollars a day, or a shilling more than the Miners' Association asks for here as the lowest wages for unskilled labour. Nevertheless, as the notes showed, the total working cost, overground and underground, in Alaska is being brought down to 80 cents a ton, or about 3s. 4d. This includes 7 cents for "construction," or, in other words, interest on redemption and plant. This *total* cost of 3s. 4d. is very much less than the *overground* costs alone on these fields, for all its cheap labour, and its native at 2s. a day. If interest and redemption on capital is taken into account, the *overground* charges on the Witwatersrand are about double the *total* costs in these new Alaskan developments. The management charges alone on the Reef are about half the total costs now in sight at Juneau. The whole question in its immediate aspect is academic. The Colour Bar is not likely to be withdrawn, and it would make mighty little difference if it were. For my part, I would like to see the whole of the restrictions on the native taken from the Statute Book. I have lived in a country three years after its slave population were admitted to free citizenship, where a large proportion of those slaves were African natives still speaking their own language; and I know that all the terrible evils expected to arise if the legislation repressing the native is withdrawn are absolutely imaginary. Those who wish to do "justice" to the native so that he can rise from his present low social position, should first of all try to stop the importation of natives in a still lower social position from outside the Union. It is the competition of these imported hordes of savages that keeps down the wages of our own native residents. It is a hopeful sign that some of the men connected with the industry are beginning to see that "cheap labour" is not necessarily cheap in its result; and that what is much more wanted is greater efficiency in methods of work, and layout, and in plant. The ideas of these few men are spreading. Only the other day, before the Dominions Commission, Mr. Schumacher said that he thought the solution of the industry's troubles lay in the direction of higher wages all round, both for whites and blacks.

There remains to be dealt with another alleged advantage to the employer in the use of coloured labour instead of white men. The white man strikes; the native does not. This advantage reminds one of the story of the newly-engaged commercial traveller, who, in sending in his expense account at the end of his first month's work, included an item for a "suit of clothes." The firm's accountant hauled him over the coals and told him that he must not put such things into his expense account. The amount was disallowed. The next month's account was passed without comment. It contained no such item as a "suit of clothes"; but the firm paid for the suit all the same. It was called something else. The native doesn't strike or make people uncomfortable at Orange Grove. When the conditions don't suit him he just squats down as a landowner and doesn't work. What is the economic difference between a "strike" and a "shortage" of native labour? The main difference that I see is that the "shortage" is much more effective, from the worker's point of view, than the "strike." The white men's "strike" has not raised white wages a penny piece in the last fifteen years. The native's "shortage" has raised native wages very considerably. The more the mines depend on native labour, the more they will be in the power of labourers who cannot be starved out by the employer. All the recruiting arrangements and agreements and Acts of Parliament of years have not stopped the advance of native wages in the past—and they won't in the future. The native is learning his power and he is going to use it. The "silent strike" is his weapon.—Yours, etc.,

E. J. MOYNIHAN.

Johannesburg, 18th May, 1914.

PROSPECTOR wants financial backing for promising deep lead (diamonds) formation under Karoo sandstone; also reef proposition in same district. Diamonds found. Reef going from 4 dwts. to 6 ozs. £200 required.—Apply "H. H.," c/o *S.A. Mining Journal*, Box 963, Johannesburg.

THE MANAGER AND STAFF OF THE SUB NIGEL, LTD.

Top Row: E. A. Shipton, shiftboss; F. Jackson, foreman carpenter; G. P. D. Bindon, sampler.
Second Row: C. Murnik, acting compound manager; T. W. Morris, assayer; C. W. Ridger, storekeeper; J. R. Clegg, white timekeeper; W. Yuill, foreman smith; A. Duncan, foreman fitter.
Third Row: W. A. C. Tayler, acting reduction officer; Basil Scholefield, resident secretary; C. S. McLean, mine captain; C. F Parry, manager; R. Tellam, resident engineer; L. McClure, surveyor; Dr. H. B. Maunsell, medical officer.
C. H. Noyce, [illegible]; L. Lowenstein, compound office boy.

Rhodesian Section.

LATEST MINING NEWS.

The Shamva—The Antelope—Globe and Phoenix Report—The Bernheim.

The following cable was despatched from the local to the London offices of the Shamva Mines, Ltd., on the 12th instant:—"Trial runs in April: crushed, 39,012 tons; average assay value feed, 3·793 dwts. per ton; average assay value residue (sands and slimes), 0·22 dwt. per ton. Gold recovered: 6,450·8 ounces fine. Estimated absorption by plant during the month of April, 7 per cent. of the gold called for. Estimated profit, £11,200. Full plant now running."

* * * *

The results from treatment operations at the Antelope are still a long way short of expectations, and there is evidently still much to be done in the way of plant adjustments, etc., before the full monthly tonnage can be handled. The working profit from the 2,937 tons treated in March was estimated at £960 only, the costs being no less than £1 18s. per ton.

* * * *

The Globe and Phoenix is still the most prosperous of Rhodesian mining undertakings, but its position as the principal producer may be threatened in the future now that crushing operations at the Shamva and Cam and Motor Mines have begun. Last year the production of gold, according to the annual report, amounted to £500,971, the largest amount recovered in the history of the company, making the total production from the mine £3,608,638; the working profit increased by £3,958 to £355,592, but the total net profit was £299,072, as compared with £312,913, and the dividend was reduced from 140 per cent. to 125 per cent. Although the total costs were 38s. 8·03d. per ton as compared with 35s. 7·1d. in 1912, the increase was solely due to the expenses of running the slimes plant and the new sands plant. On the ordinary mining, milling, and administration there was a reduction of 2s. 8d. per ton. The average grade of ore milled was 31·82 dwts., and as no high-grade ore was added during the year, the ore reserves at the close of the year showed a serious decrease in value, and the decision of the management to regulate the future profit according to the value of ore reserves is a wise precaution. The scheme for converting the trading and farm interests into a separate company is now to be given effect by the formation of a concern with a capital of £50,000 divided into shares of 5s. each, of which 160,000 will be allotted to the company. Development work this year has already resulted in a slight addition to the ore reserves, and the manager describes the outlook as brighter now that the sands plant has resumed operations. The company announces the estimates of reserves and values at March 31st last, as follows:—Payable ore reserves, 181,300 tons; average value, per ton, 27·4 dwts.; gross value, £1,043,200. In addition to the above there were on hand the accumulated sands, slimes, concentrates, and residues previously reported. At the end of December the ore reserves were estimated at 180,757 tons, having a gross value of £1,032,481; and at March 31 last year the value was £1,232,204.

* * * *

Mr. Francis Drake, general manager and consulting engineer to the Rhodesia Gold Mining and Investment Co., Ltd., in the course of his report on operations at the Bernheim Mines to the 31st December last states:—Development work has been done in the Rothschild Parallel Section, Rothschild West Extension, and in the Vesuvius Section of the property. The details of the work are shown (in feet) in the following tabulation:—

Sections	Drives	Cross-cuts.	Winzes and Raises.	Shafts.	Totals
Rothschild Parallel ...	660	11	108	126	905
Rothschild W. Extension	347	26	71	87	531
Vesuvius	386	16	—	86	488
	1,393	53	179	299	1,924

Ore Reserves.—The work done during the year has increased the ore reserves by 12,000 tons. The total calculated quantity and its value is as follows:—

	Quantity.	Assay
Rothschild Parallel Section . ..	19,130	8·96
Rothschild West Extension	1,122	11·8
Vesuvius Section	4,676	7·17
	24,928	8·76

In calculating the above quantities no account has been taken of any ore below the lowermost drives, and some low grade blocks are included. The assay value is arrived at, after rigorous reduction of high assays, and the inclusion of wall rock to bring the stoping width up to 30 inches. I am of opinion that milling results will at least equal, and probably exceed, the calculated assay value. About 80 per cent. of the calculated ore reserves is fully developed, ready for stoping. The plant and buildings have been maintained in good order.

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RHODESIAN GEOLOGICAL SURVEY.

The Report of the Director for the Year 1913—Investigation of the Gatooma Area.

I.—GENERAL REVIEW—THE GOLDEN VALLEY DISTRICT.

The report of the Director of the Rhodesian Geological Survey for the year 1913 reads as under:—I have the honour to present the annual report of the Geological Survey for the year 1913, being the report of operations for the third complete year since the establishment of the Department. Continued progress has been made in field mapping, the work having been concentrated on the goldfields surrounding Gatooma. Apart from the difficulties inherent in mapping a bush-covered country of somewhat low relief, the time occupied in mapping is considerably increased by the necessity for carrying out purely topographical work, owing either to the absence of a map or to the inadequate and sometimes inaccurate topography on existing maps. As regards the purely geological mapping, the grouping of the metamorphic rocks of the gold belts, announced in last year's report, has been found applicable to the whole district mapped. Whilst this grouping is simple and easily understood, it yet appears to be in sufficient detail to show the geological structure of the country, as well as to give a fair index to the character of the soil. Another conclusion announced in last year's report, viz., the close association of the gold ores with felsite, has found many examples, and is strikingly illustrated in the Golden Valley district, as noted below. The limitations of the felsite series is giving some trouble. It appears that in many mines and prospects the rocks known as "chert," "quartzite," etc., are in nearly all classes varieties of the felsite series, generally in a silicified condition. Banded varieties of felsite have already been described. In the Gatooma district these have been silicified and impregnated with iron oxides, when their discrimination from weathered banded ironstone becomes no easy matter. In other cases where they are impregnated with pyrites, the oxidation of the latter has produced an ironstone capping exactly resembling that found on so many of the outcrops of banded ironstone. These ironstone cappings, which sometimes run in narrow belts through the country, are often wrongly assumed to indicate banded ironstone outcrops. A number of facts of some interest to the prospector relating to the distribution of gold reefs in the districts examined, and the character and mode of occurrence of the different types of reef, is summarised in this report. Little can be said with regard to the distribution of gold within the reefs, for scarcely any facts are available for use. Mr. Zealley also contributes some interesting observations on the nature of the ancient workings in the granite country east of Gatooma. Office work has been devoted to the preparation for publication of geological maps and reports of areas already surveyed. Two reports have been issued, one treating of the geology and ores of a certain district, and one discussing the distribution of gold ores in the territory. Two coloured geological maps, one of the Selukwe mineral belt and one of the Wankie coal basin, are in the printers' hands, and will be issued as soon as possible, with full reports on the geology of the districts represented on the maps. With the permission of the Rhodesia Museum authorities, two collections of rocks and minerals illustrating the published bulletins have been placed on temporary exhibit in the Museum. The specimens are not covered in, but can be readily examined and compared with the descriptions given in the bulletins. It is intended to continue these special exhibits as other bulletins are published. It is believed that they might be made of considerable service to mining men, both for study and for comparison. If room can be found, the question of making some permanent exhibits of this nature might be discussed with the Museum authorities. Enquiries for information on a great variety of subjects have been received and dealt with during the year. The subjects dealt with are not of sufficient general interest to warrant mention here, but in one instance at least information given led to nearly doubling the gold output of a mine.

Metamorphic Rocks: Districts Examined.

A large area extending northwards from the Umsweswe River to Concession Hill on the north-east to a point beyond the Rouge Mine in the Golden Valley district in the north-west was completely mapped by the end of the field season. A smaller area around Shagari, and containing the active mines of that district, was also mapped in detail. During the year visits were paid to the districts of Enterprise, Suri-Suri, Hartley, Bulawayo, Shiloh and Pasipas, and a traverse was made westward from the Golden Valley district towards the Umniati River.

Golden Valley District.

Mr. Lightfoot surveyed this district and the country down to and beyond the Umsweswe River. The area is a comparatively low-lying one, and on the whole the topography is very subdued, except in the district east of the railway line close to the Umsweswe River. The survey is based on the beacons of the farms in the Gatooma district. These only occupy a small area adjoining the railway, and the district to the westward of the farms has been mapped by plane table in parts where the relief was sufficient, and by perambulator traverses in the flatter bush-covered areas. By these means the positions of the mines and roads have been determined. In the absence of any reliable map, a large portion of the geologist's time has necessarily been occupied in purely topographical work. Mr. Lightfoot reports that greenstones predominate and form the main country rock of the whole district. Into the greenstones has been introduced a number of masses of felsite, quartz-porphyry and granite, whilst dolerite dykes are very abundant and cut through all other rocks. Over wide areas the greenstones are massive or only slightly schistose rocks, amongst which amygdaloidal types are common, but in the gold mines and in one or two belts they are much altered and sheared. The rocks of this group usually give rise to a red soil, but some of the less basic varieties give a pale brown clayey soil. The fine-grained acid igneous rocks, including felsite, quartz-porphyry and other varieties, are of common occurrence in the district. Some of the felsites are highly schistose and pass into sericite schists, whilst some of the quartz-porphyries, which are offshoots of a granite mass, remain fresh and unaltered. Mr. Lightfoot points out that it is quite possible two groups are present, one older and one newer than the granite intrusions. A large body or series of bodies of schistose felsite runs through Gatooma and forms a line of kopjes. With it are associated flinty looking types (felsophyre), and a ferruginous rock banded in places and forming the pronounced range on which stands the geodetic beacon of Mtjintjemutje. Another band of felsitic rocks occurs just to the west of the Rosaline Mine, and trends for many miles in a direction slightly east of north. This belt is easily recognisable, as the larger bodies of felsitic rock usually are, by its pale coloured loamy soil. Throughout the greenstone schists, lying between these two acid rocks are numerous large and small dyke-like bodies of felsite, but these are only exposed artificially, the surface being covered by about six feet of red soil and rubble.

Gold Reefs.—Mr. Lightfoot finds that in almost every mine and prospect one or more of these felsite dykes is to be found. The district, in fact, affords a good concrete illustration of the conclusion announced in the report for 1912, and amplified in Bulletin No. 2, that the gold deposits of the territory are closely associated with the felsites. With the exception of two crushing rubble, all the mines in this district are on gold quartz veins. The veins are apparently all fissure veins, and are generally found near a body of felsite, in some cases actually at the junction between the felsite and greenstone. Relatively low angles of dip, *i.e.*, between

30 deg. and 45 deg., are common throughout the area. The quartz in the reefs is of two main types: (1) A glassy transparent variety which, on exposure to weathering, develops a most characteristic surface almost like satin; (2) an opaque variety containing needles and small bunches of black tourmaline. The first type is almost without exception closely associated with masses of felsite. It is usually not highly charged with sulphides, but contains disseminated pyrites, galena and blende. The fine gold is scattered like dust throughout the quartz, and often becomes visible when the specimen is wetted. Examples of this type occur at the more important mines in the district, *e.g.*, the Glasgow, Golden Valley and Masterpiece Mines. Examples of the second type occur in some abundance. They are usually not in actual contact with a body of felsite, but have greenstone schist as country rock. The reefs are often large, and some of them are often barren. The gold usually occurs in large coarse pieces, and is, of course, patchy. A few only of the reefs of this type have been proved below water-level, *e.g.*, Birdie, Rosaline. As regards distribution, a majority of mines and prospects fall into two groups: (1) a westerly group occupying a diamond-shaped piece of country between the Kenley Mine and the Rouge Mine, and (2) an easterly group occupying a narrow belt which stretches from the Guelph Mine to the Second Event Mine. Outside of the above are a few mines scattered over the district. At one time scheelite was worked near to the White Waters. The mineral occurs in a large quartz reef associated with a fine granite and lies close to a big mass of greenstone schist included in the granite. The scheelite was broken out of the quartz by hand and bagged.

(To be continued.)

Geduld Proprietary Mines.

The Secretary writes, under date May 15:—" I am directed to advise you as follows: In order to provide further funds to carry out, as soon as the labour supply permits, the programme of extended development and subsequent increase of plant as recommended in the annual report of the consulting engineer and detailed in the chairman's speech at the annual meeting held on the 6th May, Messrs. A. Goerz & Co., Ltd., have agreed in respect of the 100,000 shares at present under option to them at 25s. per share to the 8th June, 1914, to purchase 47,500 shares at 25s. per share, receiving an option on the same quantity of shares at the same price until the 8th June, 1915. The option held by Messrs. A. Goerz & Co., Ltd., over the balance of 5,000 shares at 25s. per share remains in force until the 8th June, 1914."

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS

May 26.—Springs Mines; Brakpan Mines; Transvaal Coal Trust; New Era Consolidated (Annual).

May 27.—Consolidated Langlaagte Mines; Ginsberg; Glencairn; Government Areas; New Primrose; New Rietfontein; New Unified; Van Ryn Deep; Witwatersrand G.M. (annual).

May 28.—West Rand Consolidated; Roodepoort United; New Goch; Meyer and Charlton (annual).

May 29.—Cloverfield; Vogel. Deep; Knight Central (annual); Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries; Sacke Estates (annual).

June 2.—Modder. B.; Bantjes (annual).

June 3.—Crown Mines; Durban Roodepoort Deep; Village Deep (annual).

June 17.—S.A. Gold Mines; Leeuwpoort Tins; African Farms.

June 22.—Robinson Deep (annual).

June 23.—Transvaal Consolidated Lands (annual).

June 26.—General Mining and Finance Corporation (Annual).

June 30.—A. Goerz & Co., Ltd. (annual); Robinson G.M. (annual).

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ROCK TEMPERATURES IN THE MINES OF THE RAND.*

[By E. J. MOYNIHAN.]

Some months back, in a contribution to the discussion on Mr. Blenkinsop's paper, read here in September last, on "The Ventilation of the Mines of the Rand," I pointed out that the question of the determination of the temperature gradient in rock is in a very unsatisfactory state. I said that I did not question the good faith of the observations, but that certain most important considerations had been overlooked, and that I hoped to deal with them before this Society at an early date. I am later in dealing with the subject than I expected to be. Industrial and political water has flowed under the bridges since last December, in such a torrent that many of us have found it difficult to do the dispassionate reflection that is necessary in scientific work. That is my case, and that is my apology for not having presented these notes before now. My main purpose is to show that temperatures, taken by means of drill-holes of moderate depth in stopes or development faces, are often far from the original rock temperatures; that therefore the temperatures so got often give rock temperature gradients that are far from the original; and some of the reasons why this is so. From the practical and historical standpoint this paper is therefore largely of a critical character. I shall also attempt to forecast the minimum air-gradient to be expected without mechanical refrigeration. The first contention is easily proved by a reference to the diagram of rock temperatures contained in Messrs. Whitehouse and Wotherspoon's paper read here in May, 1911. The temperatures there given from drill-holes are such, that by choosing different pairs of them, 1,000 feet or so apart vertically, it would be possible to deduce either a positive gradient (temperature increasing in depth) or a negative gradient. One can show a wide difference in temperature between points on the same level, or practically no difference in temperature between points at a vertical distance of 1,500 feet apart—in short, almost any gradient can be shown if one chooses the two reference points suitably. By continuing the line obtained from different pairs of such temperatures till it cuts the surface level, one can deduce any surface temperatures from about 51 deg. to 71 deg. F.—a difference of 20 deg. This is more than the difference for 5,000 feet vertical, according to the gradient deduced by Messrs. Whitehouse and Wotherspoon. The actual temperature of the undisturbed rock within a few feet of the surface under normal conditions is, and must be, within a degree or so, the mean surface temperature at that place as taken over an average of a fair number of seasons. The subject of the variation of solar radiation is so new, and observations in that connection so few, that we do not know for how many seasons one must observe to get a fairly correct mean. Nor do we know whether the common custom of taking half the sum of the maximum and minimum air temperatures gives a very truthful "mean." It seems quite possible that a better and quicker way of getting the mean temperatures of any place would be to drill a borehole, say, 1,000 feet in depth, in a dry spot, and in hard rock, to put an electrical resistance thermometer at the bottom, fill the hole with cement to within 500 feet of the top, and then put in a second thermometer and cement the hole up to the top. On the assumption that the mean gradient is uniform, one arrives at a certain mean temperature for the surface, which is probably as near the truth as the result of any air temperatures yet taken. All rock temperature gradients should practically pass through this temperature at the surface. However, failing this, or some other reliable method, we must make the best of what we have, and that is the mean air temperature of the place. Any gradient based on the temperature of the air, or rock walls, in shafts and near the surface is unreliable. The shaft may be up-cast, when the temperature at the top is usually too high; or down-cast, when it is often too low. The most casual reference to the diagram in Messrs. Whitehouse and Wotherspoon's paper, or to the figures contained in the last Government Mining Engineers' report, serves to prove this. The following are the official mean annual surface temperatures for 1910 for the Transvaal: Observatory, Johannesburg, 58.4 deg. F.; Joubert Park, Johannesburg, 59.9 deg. F.; Sunnyside, Johannesburg, 58.7 deg. F.; Zuurbekom, 59.4 deg. F.; Vereeniging, 60.8 deg. F. We are therefore fairly safe in taking the mean temperature of the Rand, for the purpose of these calculations, at 60 deg. F. It is perhaps a little too high, and therefore tends to flatten the gradient calculated from temperatures read at depths. Take, as an instance of what I have already said, the six temperatures from Marriott's mine for 500 feet below the surface. The highest and lowest temperatures for the six are 68 deg. F. and 56 deg. F. respectively, a difference of 12 deg. This is practically the same difference as that between the highest Marriott reading for a depth of 500 feet and his reading at 3,300 feet. When one gets the same variation in drill-hole temperatures, all taken at one level, as is obtained between two holes 2,800 feet vertically apart, it is clear that temperature-gradients plotted from such observations must be worthless guides to the original gradient of the rock. The errors of observation may be as great as the deduced difference of temperature in 2,800 feet. This is actually and obviously the case with the Marriott observations plotted by Messrs. Whitehouse and Wotherspoon. Messrs. Whitehouse and Wotherspoon's own observations show errors of much the same kind. Two of their readings show a difference of 3 deg. at practically the same level of 3.200 feet. This is a greater difference than is plotted between the hotter of those at 3,200 feet and the temperature given at the 3,800 feet level; and is also greater than the difference between the cooler of them and the lowest temperature in the Village Deep. The difference of temperature shown in the Village Deep and Turf shaft readings, for a difference of level of 1,600 feet, is little more than twice the plotted difference of temperature for two Village Deep readings taken at the same level. Let any one make a tracing of the diagram, omitting the gradient lines drawn by Messrs. Whitehouse and Wotherspoon, and ask himself, or any one, "What curve would show fairly the law connecting the points on the squared paper?" Any one used to plotting curves would at once say that the errors of observation were so big that he must "give it up." There is not even any evidence from the points plotted that the law is a straight line. The low gradient arrived at by Messrs. Whitehouse and Wotherspoon is obtained by assuming (by implication) a surface temperature about 5 deg. too high, and then plotting the gradient so as to pass below most of the points plotted from their deeper observations, and through none of the points referred to in their text. They say, in the first column of their text, that the temperature of the rock varies from 65 deg. F. at 200 feet to 98 deg. F. at 7,000 feet. The gradient line that they draw on their curve passes through the surface at above 65 deg., through 200 feet at 66 deg., and through 7,000 feet at less than 93 deg. They say it is apparent "from the chart" thus drawn, that the "estimated rate of mean temperature rise is now represented to be 1 deg. for 253.9 feet." It is not "apparent" at all; the gradient on the chart might as justifiably be drawn in a dozen different ways; the figures given in the text, by the authors themselves, in no wise agree with the gradient line plotted on the chart; their text figures imply a gradient of 33 deg. in 6.800 feet, or closely 1 deg. for 206 feet; and it is obvious therefore that the general inductions from the chart are of little scientific value. If a careful examination of their other figures is made this conclusion is further borne out. The paper is accompanied by a schedule of "psychometrical" observations showing dry and wet bulb temperatures, at various times and places, before and after the installation of the fan on the Village Deep. They deduce from these observations that the installation of the fan materially reduced the air temperature and humidity in the mine. The reductions in both cases may be allowed to be facts; but there is no evidence that they were due to the fan. The average reduction in the temperature according to the authors was from 2 deg. to 3 deg. F. at distances of 1,000 feet from the shaft stations; and the reduction in humidity was from 2 per cent. to 6 per cent. The readings compared, in order to find out the effect of the fan, were taken in January and February (before the fan was installed) and in May (after the fan was installed). Now, the temperature and humidity in the mine depend, in a considerable degree, on the temperature and humidity of the air at the surface. The surface figures are printed in their paper. These show quite good cause for the reduction in temperature and humidity without the existence of the fan at all. The maximum and minimum surface dry-bulb temperatures, for January and February, were 80.2 deg. F. and 57.2 deg. F.; for May, 71.6 deg. F. and 38.1 deg. F. The surface humidities, for January and February, were never below 48.2 per cent.; in May, 15 out of 21 readings were materially below this figure. From the Transvaal Meteorological Report for 1910 it can be seen that the mean air temperature for January was about 64 deg., for February 63 deg., and for May 54 deg. This is quite enough to account for a corresponding seasonable and average difference of 2 deg. to 3 deg. in the Village Deep mine. The mean surface humidity in January (for six seasons) was 73 per cent., in February 76 per cent., and in May 52 per cent. A difference of this order fully explains a diminution of 2 per cent. to 6 per cent. in underground humidity. In dealing with the effect of surface temperatures on the temperature of a mine, it must be borne in mind that though surface seasonal variations in temperature from one month to another produce a considerable effect on the mine workings, large surface variations in two or three days produce very little effect, owing to the walls of the mine acting as a heat reservoir. Therefore comparisons of underground and overground temperatures at one particular instant in a large and deep mine are practically of no value whatever. Even in an ordinary office building it will take several days for the internal temperature to adjust itself to a sudden change of 10 deg. in the mean external temperature. In all that follows, it is therefore to be understood that I am dealing with mean temperatures taken over a period of something like a month or more.

(To be continued.)

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*A paper read at the last monthly meeting of the Chemical Metallurgical and Mining Society of South Africa.

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Engineering Notes and News.

THE FLYING TRAIN.

[By a Special Correspondent.]

The local papers have recently drawn the attention of the public to the so-called " flying trains," and there seems to be a general misconception of what they really are. I will therefore try to describe this ingenious machine. The word " train " is rather unhappily chosen, as, so far the whole matter has not passed the laboratory stage, and the machine is only a working model. It only has that much in common with a railway train that it consists of a moving body or carriage, and a track. It does not fly in the air, but is moved along just slightly above the track. The inventor, Mr. Emile Bachelet, a Franco-American, is probably the first who has attempted to utilize what is generally called eddy currents, or Foucault's currents, to lift heavy weights. It is a well-known fact that these currents under certain circumstances, will flow through and lift a conductor which is brought into the magnetic field above a coil through which alternating current is passing. And on this principle is based the invention of Mr. Bachelet. His carriage consists of a torpedo-shaped body of aluminium with a bedplate of the same metal protruding at both sides. Aluminium is chosen on account of its lightness and its particular suitability for the formation of eddy currents. This plate rests on the track which consists of vertical coils arranged along the whole length of the track at a distance of a few inches. As soon as an alternating current passes through these coils eddy currents are formed in the bedplate of the carriage, and these lift the carriage clear off the track, by about an inch or two. A special " Synchron-Interrupter " is used to increase the pressure of the induction current, and consequently increase the strength of the eddy currents; such details, however, I am not in a position to describe, and I will confine my notes to a general description of the principle of the invention. When the carriage is lifted the next point for consideration is how to move it along. This is done electro-magnetically. A series of electro-magnets, placed in the carriage, is re-acted on by circular electro-magnets, which are placed on the track at certain intervals, and through these the carriage glides like through a tunnel. An overhead line and a brush contact provide the current for the coils in the carriage. That much for the general arrangement. It will be seen at once that it is a very costly installation, and the efficiency of the plant is very low indeed. It requires about one kilowatt to lift 12 lbs., but I do not know how much power is consumed in moving the carriage along. Although there are no frictional resistances on the track the power must be very considerable as the carriage is moving at very high speeds, and the air resistance naturally increases as the square of the speed. Neither do I know how the inventor means to overcome the difficulty offered by curves and crossings, as his experiments, as far as I know, have been made on a straight track only. Taking everything into consideration it looks to me that the invention, ingenious and interesting as it is, is not one that will be put to any practical use for a long time to come, as the cost of the track, etc., and the relative usefulness are in no proportion, and even if one would not look at the capital outlay I believe that the running cost would make the use of this " flying train " prohibitive. Even assuming that the near future would show such improvements as to make it desirable to construct a " flying train " on a larger scale, for instance for the conveyance of mails, I doubt whether the benefits gained by the increased speed will be sufficient equivalent for the enormous power consumption. It must also be considered that these eddy currents generate an enormous heat in their conductors; this heat, in the present case, is wasted energy, and furthermore may, in the case of a larger machine, become excessive and thus make it impossible to turn the machine to proper use. It requires a lot of good work to overcome all these difficulties. Mr. Bachelet has set a stone rolling by constructing a moving body without any mechanical movement, thus eliminating all frictional losses in bearings, pistons, rods, rails, etc., and it is to be hoped that other engineers will co-operate in thoroughly investigating the possibilities of his invention.

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The Breaking of Drill Steel.

The inability of drill steel to " stand up " in a hammer machine was discussed at a recent meeting of the Mining and Metallurgical Society of America. Mr. Le Fevre stated that the chief difficulty thus far at Mineville in the use of hammer machines had been to procure steel which would stand up. Cruciform 1-in. steel did not seem to have enough metal, so that company expected to try 1¼-in. octagon. The jackhammers using round hollow steel, break the shanks when the hole gets down 6 or 7 ft., and the borings do not come out freely. Mr. Spilsbury stated that the peculiar fractures to which the hollow steel drill, under the impact of the hammer, seemed to be subjected, did not appear to be due simply to the actual blow of the hammer, but to an interior condition of abnormal strain in the structure of the steel itself. He thought that possibly the trouble was due to the method under which these hollow drills are produced. The ingot is first punched and then forged down on a mandrel. Any defect, or ragged edge, on the punch originally used would cause striations along the interior surface of the hole and in the subsequent hammering down over the mandrel, these lines would never be entirely obliterated. The grooves might be closed but would probably include a slight film of oxide in their folds which would still remain in the finished drill, and under the jar of operation would naturally become a source of weakness. This trouble would also be increased by the unequal annealing of the material during the time of its reduction, owing to the fact that surfaces exposed to the mandrels would be cooled more rapidly than the rest of the material and shrinkage strains would probably be set up. He believed that this was the direction in which to look for the cause of the rapid failures rather than to the quality of the steel. R. M. Catlin said he had an idea that the breaking of the drills was due to inequalities in the steel, although he had never seen a longitudinal fracture in a drill. The fractures with which he was familiar indicated a nucleus, and correlation indicated that the fracture had begun from this nucleus and spread outward. As is observed in a flaw in glass, these were concentric rings spreading out from a central point. It seemed as though there were in the nucleus some substance which had developed, under the strain of the vibrations or of heat, a tendency to expand more than the elasticity of the steel could accommodate. This nucleus seemed to run through the length of the steel, and if broken anywhere, one could expect to find it. There can be had steel of all kinds and prices from 5c. to over 30c. per lb. As a matter of fact, the higher-priced steel does not seem to be the more durable. A trial of hollow steel having an absolutely round hole, gave no better results, even though it was a drilled hole. W. L. Saunders said his company had experimented a great deal on the subject of the round hole, and had to give it up. They thought that the mandrel might have a great deal to do with it, and went to great expense to bore a hole in a piece of the best quality of steel, but experienced the same trouble. The steel problem is being solved, he said, not by American, but by foreign metallurgists, and the steel with a hole in it that is now standing up best under the hammer blow is of foreign make. Referring again to the difference between a piston and a hammer drill, in the latter the bit is pressed against the bottom of the hole, and is then struck a thousand blows per minute. Probably 10 per cent. of the blows are struck when the bit does not touch the bottom of the hole, since one cannot press a piece of steel against the bottom of a hole and hammer it without the steel's bouncing back.

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THE ACTION OF ACID MINE WATERS UPON ELECTRIC INSULATION.

Electric conductors in mines are very often exposed to the action of moist air and acid water. The insulation may become so impaired that shocks are received from conductors that have previously been considered safe; it is sometimes entirely destroyed. The Bureau of Mines has recently investigated the action of sulphuric acid and iron sulphate upon the various materials used to insulate electric conductors, inasmuch as it was found that these were the only deleterious constituents of a large number of mine water samples. The solutions were sprayed upon the insulations intermittently, with the purpose of securing an approximate simulation of mine conditions. The following kinds of insulation were thus tested: Standard 30 per cent. Para rubber, made in accordance with the specifications of the National Rubber Covered Wire Engineers' Association; standard varnished cambric; varnished cambric treated with a compound designed especially to resist the action of acid, and paper protected with a lead sheath. The results of preliminary tests have been set forth in *Technical Paper* No. 58, of the Bureau of Mines, written by H. H. Clark and L. C. Ilsley. According to the authors, the following two solutions were used:—(1) 4,500 parts of free sulphuric acid to 1,000,000 parts of water; (2) the first solution with an addition of 12,000 parts of ferrous sulphate. Quite complete data are given, and the following discussion of results summarizes the paper:—The results of the tests show little difference between the action of the two solutions. Both solutions had about the same effect upon the cambric and the special samples. The rubber samples that were treated with solution No. 2 did not show as well as the other samples in the tensile-strength tests, but otherwise the effect of the two solutions seemed to be the same. The results of the test seem to indicate that sprinkling the acid solutions upon the samples is the method of application best adapted to hastening the deleterious action of the solutions. This conclusion is based upon the observation that the parts of the samples that were allowed to remain moist all of the time were seemingly not impaired as much as those parts that were alternately wetted and dried. So far as could be discovered neither bedding the samples in coal dust nor letting acid solution drip on them increased the severity of the conditions. Although the acid may have promoted the entrance of moisture between the layers of tape of both the cambric and the special samples, it was not discoverable that the acid had actually affected the tapes beyond the first one or two layers. So far as could be seen the acid had no destructive effect on the rubber insulation or on the lead sheath of the paper-insulated telephone cable. The paper-insulated, lead-sheathed telephone cable having been tested merely to determine the action of the acid on the lead, is not considered in the following statements regarding the relative resisting power of the insulations tested. The rubber insulation undoubtedly withstood better than the cambric and special insulations the treatment accorded to all. The percentage of decrease in insulation resistance was far less in the case of the rubber samples than in the case of either the cambric or the special samples, and at the end of the test the insulation resistance of the rubber samples was comparatively high (more than 20,000 megohms). The breakdown voltage of the rubber insulation held up well also. The cambric samples were the most affected by the treatment, for although both cambric and special samples decreased in insulation resistance to less than 2 per cent. of their original values, the breakdown strength of the special samples was well maintained throughout the test, whereas all but one of the cambric samples broke down on high potential during the test. The insulation resistance of the cambric and the special samples decreased because moisture penetrated between the layers of tape that constituted the insulation of these samples. The data obtained from the control test pointed to this conclusion. The results obtained from measuring the resistance of the various tapes and the evidence of "drying out" that was observed in several tests indicate that moisture was the chief cause of the failure in insulation resistance. The result of the microscopic examination indicates that the presence of acid promoted the entrance of the moisture. The reason is not so clear for the failure of the rubber insulation. The results of the water test of the rubber samples seem to show that the treatment with pure water decreases the insulation resistance as rapidly as does treatment with acid solutions. Yet it is hard to believe that the deterioration of the rubber was due to the effect of moisture alone, and it seems more reasonable to consider that the rubber became impaired by the combined effect of temperature, exposure to air and exposure to the action of the acid solution. The principal fruits of the investigation were the data made available for organising future tests.

TO CONTRIBUTORS.

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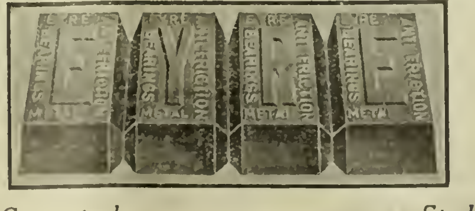

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Boksburg Trackless Trams.

Boksburg now possesses the first railless traction system to be seen in South Africa—though the neighbouring town of Germiston is proceeding with a railless equipment of somewhat different construction. The plant is, of course, necessarily quite small, and only six cars are to be put in service at present; but for this reason alone, the adoption of a railless system proves interesting. The Brakpan Power Station of the Victoria Falls and Transvaal Power Company is in the immediate neighbourhood, and a 10,000-volt 3-phase line supplies a transformer sub-station at Boksburg—from which sub-station a 2,100-volt supply is taken for the lighting of the town. There are some nine transformers distributed throughout the town, fed by the above 2,100-volt supply, and from these a 230-volt 3-phase supply at 50 cycles is taken for lighting and power. A 2,100-volt 3-phase feeder cable runs from the power company's transformer sub-station, which contains two Bruce-Peebles motor-converters of the standard two-bearing type, each of 150 kw. capacity, and running at 750 r.p.m. The converters deliver direct current for the cars at 500/575 volts, and synchronising is very easily accomplished by a variable resistance in the rotor circuit. The whole of the switchgear is exceedingly simple. In addition to the converting plant, Messrs. Bruce Peebles obtained the contract for the switchgear, which was sub-let to Messrs. A. Reyrolle & Co. The h.t. gear consists of one feeder panel and two converter panels, with oil switches and the necessary overload attachments, and is placed on a slightly raised platform facing the converters. The direct-current gear consists of two generator panels, two feeder panels and two circuit-breakers coupled direct to the D.C. bus-cars, for supplying the car sheds. This gear was erected by the South African representative of Messrs. Bruce Peebles, who, of course, carried out the erection of the motor-converters. The severe lightning storms which are encountered in this country have made it necessary to instal a fairly large number of lightning arresters on the trolley lines, and all frames of switchgear and converters are " earthed " by copper conductors. The overhead equipment is of the ordinary double trolley wire construction, on span wires, and there are some four miles of this already completed; a further two miles of single track construction on side arms is being carried out by the electrical engineer. There is no protection against lightning upon the cars themselves, the protection on the trolley lines being considered sufficient to safeguard the cars—but the passengers' grab-handles are effectively insulated from earth. For the present it is proposed to run only two shifts at the sub-station, and the operating staff consists of a skilled man on each shift, with an unskilled helper. The cars themselves are of the single-deck type, with one front entrance, and will be operated by a driver only on the " Pay-as-you-enter " system, much in vogue in Canada and the States.

* * * *

Imperial Cold Storage Report.

The following is the report of the directors of the Imperial Cold Storage and Supply Company, Ltd., for the year ended December 31, 1913, to be submitted to the shareholders at the annual meeting to be held at Johannesburg on Monday, June 15: Your directors beg to submit their report, together with balance sheet and profit and loss account, for the year ended December 31, 1913. The issued capital of the company stands at £344,606, the increase from the amount of £343,358 shown on the preceding balance sheet being due to a further issue during the year of 1,248 shares of £1 each in exchange for holdings in kindred undertakings in accordance with the agreement of April 12, 1911; 5,394 shares of the new " 1911 " issue still remain to be allotted under this agreement. During the year debentures of the nominal value of £4,900 have been redeemed through purchase, and the issued amount of first mortgage debentures has accordingly been reduced to £445,700. The profits of the company having been maintained during the first six months of the year under review, your directors felt justified in declaring an interim dividend of 2½ per cent. (6d. per share), which was paid on December 15, 1913. The ordinary income for the year under review amounted to £63,188 7s. 9d., whilst the expenditure for that period, including debenture interest, £22,246 5s., and reconstruction expenses, £44 12s., amounted to £29,814 19s. 8d. The cash resources of the company stand at £105,107 19s. 5d. as against £124,941 2s. 3d. in the preceding balance sheet, the decrease in this respect being accounted for by increased values under other headings. The directors are pleased to state that, notwithstanding the drought and industrial unrest which affected South Africa during the year, the company's business shows some improvement for the period under review. In terms of the resolution adopted at the annual meeting of shareholders in 1912, Senator S. Marks retires as director this year, but is eligible for re-election. Messrs. E. R. Syfret & Co. offer themselves for election as the company's auditors for the ensuing year, and shareholders will be asked to fix their remuneration for the past audit.

Voluntary Liquidations.

Pretoria Master Building Trades' Association, Ltd., Pretoria.
Carter Diamond Prospecting Syndicate, Ltd., Johannesburg.
The Rhodesian Research Co., Ltd., Johannesburg.
Springbok Flats Exploration Co., Ltd., Johannesburg.
The Whitehills Estate and Gold Mining Co., Ltd., Pretoria.
Modderfontein Proprietary Mines, Ltd., Johannesburg.
Benoni Consolidated Gold Mines, Ltd., Johannesburg.
Golden Valley Syndicate, Ltd., Johannesburg.
Sandbult Diamond Syndicate, Ltd., Johannesburg.
Provincial Stock Farmers, Ltd., Johannesburg.
Abelheim, Landau & Co., Ltd., Johannesburg.

Rezende Mines.

The results at the Rezende Mines for April are as follows:—Central Section, £1,893; Old West Workings and Penhalonga Sections, £912; estimated profit, £2,805.

Mining Certificates.

Private Individual Tuition for Mine Managers, Foremen, Mine Surveyors, Mechanical and Electrical Engineers, and Engine Drivers' Examinations. Practical Mathematics and Electrotechnics. Correspondence Lessons if Personal Tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 35/6, Cuthbert's Buildings, Box 2061, Johannesburg.

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THE WEEK IN THE SHAREMARKET.

Dull and Quiet—Waiting in London—Holiday Tone.

A HOLIDAY tone has taken possession of the market, and very little business indeed was done during the week. The improved returns from the mines have been without effect in face of the general apathy; and with small hope of a lead from London, business here must remain in the doldrums. Tins and diamonds are likewise lifeless; and business all round appears to have touched bottom. The annual reports of Messrs. Goerz & Co., Ltd., and the Anglo-French received this mail from London are not very cheerful reading; and the Central Mining report, though showing much better results, has also had no great effect in improving matters. The fears of further labour troubles seem to be exerting a depressing influence.

	* Fri. 15th.	* Sat. 16th.	* Mon. 18th.	* Tues 19th.	Wed. 20th.	Thur. 21st.
Adair-Ushers	0 5*	0 5*	0 5*	0 5*	0 5*	—
African Farms	12 0*	12 3*	12 0*	12 0	11 9*	—
Apex Mines	–	17 0*	18 3†	—	16 9*	—
Aurora Wests	18 0	—	—	—	—	—
Bantjes Cons	14 3†	—	—	—	—	—
Brakpan Mines	40 0*	—	—	—	—	—
Breyten Collieries	27 0*	27 0*	27 0*	27 0*	27 0*	—
British South Africas	—	17 0*	—	—	—	—
Bushveld Tins	0 6	0 6*	0 6*	—	—	—
Cassel Coals	—	—	—	15 0*	—	—
City and Subs.	49 6	49 0*	49 0*	48 6*	50 0†	—
City Deeps	64 0*	64 3*	65 0*	65 0*	65 0*	—
Cloverfield Mines	4 0*	4 1*	4 0*	4 3	4 1*	—
Clydesdale Collieries	9 6*	9 6*	9 6*	9 6*	9 6	—
Con. Langlaagtes	31 9*	32 0*	32 0*	32 6*	32 6*	—
Con. Main Reefs	17 0*	17 3*	17 0*	16 9*	16 9*	—
Con. Mines Selection	7 6*	—	—	7 0*	—	—
Coronation Colls.	21 0†	—	20 0†	21 0†	18 0*	—
Coronation Freeholds	0 4*	0 5†	0 4*	0 4*	0 4*	—
Crown Diamonds	5 0*	5 0*	—	—	—	—
Crown Mines Deb.	£98½*	£98½*	£99*	£98*	—	—
East Rand Centrals	2 0*	2 0*	2 0	—	2 0*	—
East Rand Coals	1 7*	1 6*	1 6*	1 6	1 6*	—
East Rand Deeps	—	—	1 5*	1 5*	1 5*	—
East Rand Props.	35 0*	—	35 0*	35 0*	—	—
East Rand Debs.	£85*	£86½*	£86*	£87½*	£87½*	—
Eastern Golds	1 0*	1 0*	1 1	1 0*	1 0*	—
Ferreira Deeps	—	—	42 6*	42 6*	42 6*	—
Frank Smiths	3 3*	3 3*	3 4*	3 4*	3 3*	—
Geduld Props.	23 0*	23 9*	23 9*	23 6*	23 9*	—
Geldenhuis Deeps	22 6*	25 0†	—	—	—	—
Glencoe Collieries	6 6*	6 6*	6 6*	—	—	—
Glynn's Lydenburgs	11 0*	—	10 0*	10 0*	10 0*	—
Govt. Areas	20 0*	20 3	20 0*	20 0*	20 3	—
Joh. Bd. of Ex.	24 0†	23 9*	23 9†	23 9†	23 9†	—
Jupiters	—	—	—	—	4 0*	—
Kaalfonteins	0 3*	0 3*	—	0 5†	0 3*	—
Klerksdorp Props.	2 4	2 4*	2 5	2 5*	2 6	—
Knight Centrals	8 0	8 2*	8 0*	8 0*	8 1*	—
Knights Deeps	36 0†	36 0†	—	—	—	—
Lace Props.	3 1*	3 2*	3 3*	3 1*	3 2*	—
Langlaagte Estates	—	17 6*	—	—	—	—
Luivaardsvlei Est.	9 6*	9 6*	9 6*	9 6*	—	—
Lydenburg Farms	2 6*	2 8*	2 7†	2 5*	2 6*	—
Jumpers	4 0†	4 0†	4 0†	—	4 0†	—
Main Reef Wests	—	5 6*	6 0†	5 6*	5 6*	—
Meyer and Charltons	—	—	—	—	107 6*	—
Middelvlei Est.	1 0*	1 1*	1 0*	1 0*	1 0*	—
Modder B.'s	82 0*	83 0*	84 0†	—	83 0*	—
Modder Deeps	47 0	47 6	47 3*	47 9	48 3*	—
Natal Nav. Colls.	15 6†	15 0*	15 0*	—	15 0*	—
New Boksburgs	—	0 9*	0 9*	0 9*	0 9*	—
New Eland Diamonds	27 0†	—	—	—	28 0†	—
New Era Cons.	5 3*	5 3*	5 6*	5 6*	5 9†	—
New Geduld Deeps	1 9*	1 9*	—	1 9*	—	—
New Gochs	14 0*	14 0*	14 3*	14 0*	14 0*	—
New Heriots	63 6†	—	—	—	—	—
New Kleinfonteins	22 6*	23 0	23 6	23 0	22 9*	—
New Modders	250 0*	250 0*	247 6*	—	250 0*	—
New Rietfonteins	3 0†	—	3 0†	2 9*	3 0*	—
Nourse Mines	—	—	—	—	25 0*	—
Pretoria Cements	45 0*	45 0*	45 0*	45 0*	45 0*	—
Princess Estates	4 6*	4 6*	—	—	4 9*	—
Rand Klips	—	2 3*	2 3*	2 4*	2 3*	—
Rand Nucleus	1 7*	1 7*	1 7*	1 7*	1 8*	—
Randfontein Deeps.	3 4*	3 6*	3 6*	3 8*	3 6*	—
Roberts Victors	—	—	—	15 0*	15 0*	—
Robinson Deeps	—	30 0†	—	—	—	—

*Buyers. †Sellers.

	Fri. 15th.	Sat. 16th.	Mon. 18th.	Tues. 19th.	Wed. 20th.	Thur. 21st.
Rooibergs	22 6*	23 6*	23 6	22 0	21 9*	—
Ryan Nigels	2 6*	3 0†	2 6*	2 6*	2 6*	—
Shebas	4 6*	4 6*	4 6*	4 6*	4 6*	—
Simmer Deeps	1 6*	1 6*	1 6*	1 6	1 6*	—
S.A. Breweries	39 0*	39 6*	39 9*	—	39 6	—
S.A. Lands	2 6*	2 6*	2 7	2 6*	2 6*	—
Springs Mines	12 0†	12 3†	—	—	—	—
Sub Nigels	10 0*	10 6*	10 6*	10 6*	10 6*	—
Transvaal Coal Trusts	—	—	—	26 0*	—	—
Trans. G.M. Estates	37 6*	37 6*	37 6*	37 6*	38 0*	—
Van Ryn Deeps	44 9	44 9*	44 6*	44 6*	44 9	—
Village Deeps	37 3*	37 6*	—	37 6*	37 6*	—
Vogel Con. Deeps	1 0†	—	—	—	—	—
West Rand Cons.	8 0*	8 6*	8 0*	8 0*	—	—
Western Rand Est.	2 0*	—	2 0*	—	2 3*	—
Witbank Collieries	43 6*	43 6*	43 6*	43 6*	45 0†	—
Witwatersrands	68 6*	—	—	—	68 9*	—
Wit. Deeps.	51 6*	—	52 0*	52 0*	52 0*	—
Wolhuters	13 9*	13 9	13 9	13 9*	13 9*	—
Zaaiplaats	25 3*	27 0	26 9*	25 0	24 6*	—

*Buyers. †Sellers.

Foreign Companies Registered.

The "Rowe" Sewage Purifying Syndicate, Ltd., care of Henry Rowe Rowe, 419 Consolidated Building, corner of Fox and Harrison Streets, Johannesburg; capital £2,000.

Opstal Diamond Syndicate, Ltd., care of Arthur Kenmuir, corner of Fort Street and Market Avenue, Benoni; capital £12,500.

The Consolidated Pneumatic Tool Co., Ltd., care of H. J. Gregson, 3 and 9 Cullinan Buildings, Simmonds Street, Johannesburg; capital £300,000.

The Sakalava Madagascar Proprietary Oil Fields, Ltd., care of Charles Wilson Herald, 71 Standard Buildings, Joubert Street, Johannesburg; capital £100,000.

Naamlooze Vennootschap Harlingen tot Exploitatie van een Nederlandsche Landbouwnederzetting, en Vee Depot in Zuid Africa, care of Sipke Posthuma, Farm Harlingen, Bethal; capital 350,000 gulden.

Additions and Alterations.

Associated Mines of Rhodesia, Ltd., Johannesburg.
Henderson Transvaal Estates, Ltd., Johannesburg.
Harrisdale Diamonds, Ltd., Johannesburg.

Elandsfontein Estate Company, Ltd.

(Incorporated in the Transvaal.)

Interim Dividend No. 52.

NOTICE is hereby given that an Interim Dividend (No. 52) at the rate of 5 per cent. (One shilling per share) has been declared by the Board of Directors, payable on 5th June, 1914, to all Shareholders registered in the Books of the Company on 27th MAY, 1914.

The Transfer Books of the Company will be closed from 27th May to 30th May, 1914, both days inclusive.

Dividend Warrants will be posted to Shareholders on the 5th JUNE, 1914.

By order of the Board,

THE CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA, LIMITED
Secretaries.
per J. D. LOW.

Head Office: Consolidated Gold Fields Buildings,
Simmonds Street,
Johannesburg,
19th May, 1914.

QUARTERLY REPORTS.

Durban Roodepoort Deep.

The profit earned by the Durban Roodepoort Deep in the quarter ended 31st March, 1914, was £6,027, after deduction of Miners' Phthisis Fund assessment. Development work was as follows:—Number of feet driven, sunk and risen, exclusive of stopes, 2,209 feet. The reef disclosures were as follows:—Main Reef: Distance exposed, 400 ft.; width, 37 ins.; assay value, 46s. 7d. South Reef: Distance exposed, 792 ft.; width, 11 ins.; assay value, 120s. 6d. *Reduction Works.*—Ore received from mine, 72,688 tons; waste sorted out, 9.1 per cent.; tonnage crushed, 65,800 tons; number of stamps operating, 100; number of tube mills operating, 3. Value of ore before crushing (reflected by mill yield and value of pulp) (the value per ton is calculated at 84s. per fine oz.): Mill yield per ton, 20s. 2d.; assay value of pulp, 8s. 2d.; total, 28s. 4d. Total yield, 21,205 ozs. fine: total yield per ton, 27s. 0d. The development footage for the quarter, at 2,209 feet, shows a decrease of 174 feet, the operations being somewhat interfered with by the strike of miners in January and by the continued shortage of native labour. Only small footages were accomplished in No. 1 and the Western Sub-Inclines, but good progress was again made with the 12th level main haulage drive from No. 1 shaft. The disclosures on both reefs are again satisfactory, those of the Main Reef showing considerable improvement, much of this development being in one of the known rich chutes. The continued shortage of labour necessitated the breaking of a high proportion of the Main Reef, there being mined for the period 57 per cent. of this lower grade ore body; an improving labour force during March and April is now permitting of this percentage being lowered and a greater tonnage will be obtained from the higher grade South Reef by means of hammer boys, which should show an increase in profits. Both the yield and profit per ton were slightly lower for the quarter, and, with a decreased tonnage, the profits, at £7,775, show a decrease of £2,224. The expenditure on capital account amounted to £1,298, and it is estimated that a further sum of £1,483 will be required in respect of authorised votes. The seventeenth ordinary general meeting of shareholders will be held in the Board Room, The Corner House, Johannesburg, on Wednesday, 3rd June, 1914, at 11 a.m.

Tell advertisers you saw it in the *South African Mining Journal.*

Consolidated Main Reef.

Expenditure and revenue for the quarter ended 31st March, 1914 (calculated on the basis of the tonnage milled), was as follows:—Expenditure, £60,625 11s. 2d.; profit for quarter, £23,910 11s. 8d.; revenue, £84,536 2s. 10d. *Note.*—No allowance has been made in the above statement for the Government tax on profits. The capital expenditure was as follows:—Shafts, £5,032 2s. 5d.; buildings, machinery and plant, £2,508 12s. 1d.; total, £7,540 14s. 6d. *Milling.*—Stamps running, 89.83; time run, 79.40 days; three tube mills ran 69.96 days; tons crushed, 54,880 tons; duty per stamp per day, 7.518 tons; yield in fine gold, 15,531.186 ozs.; yield in fine gold per ton crushed, 5.660 dwts. *Cyaniding (sands and slimes).*—Sands treated, 26,550 tons; slimes treated, 28,330 tons; yield in fine gold, 4,638.254 ozs.; yield in fine gold per ton crushed, 1.690 dwts.; cost per ton treated, 1s. 8.123d.; recovered from all sources employed per ton milled (fine gold), 7.350 dwts. *Development Work.*—Drives, 1,681 feet; raises and winzes, 756½ feet; ore passes, 31½ feet; main crosscuts, 359½ feet; No. 2 shaft sinking, 10 feet; total, 2,838½ feet. *Assay Values.*—Excluding shaft sinking, main crosscuts and ore passes, 1,911 feet or 78.4 per cent. has been on reef, and of this 1,882 feet have been sampled. Of this 1,196 feet, or 63.5 per cent., has been payable of an average value of 10.5 dwts. over 48 inches, and 686 feet, or 36.5 per cent., has been unpayable of an average value of 3.5 dwts. over 48 inches. Of the payable portion 1,130 feet, or 94.5 per cent., has been on Main Reef Leader, value 10.8 dwts. over 48 inches, and 66 feet, or 5.5 per cent., has been on South Reef, value 5.5 dwts. over 48 inches. *Ore Reserves.*—Ore reserves, 1st January, 1914, 610,490 tons; ore developed for quarter, 45,405 tons; less ore mined for quarter, 62,577 tons; less difference in stoping width, Main Reef mined but not shown in reserves and from stopes previously called unpayable, 12,062 tons; ore reserves, 31st March, 1914, 605,380 tons. *Mining.*—Ore mined for the quarter, 62,577 tons; less waste sorted out (12.30 per cent.), 7,697 tons; difference in bins, nil; ore milled for the quarter, 51,880 tons.

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See Our Exhibit at the Mining Exhibition.

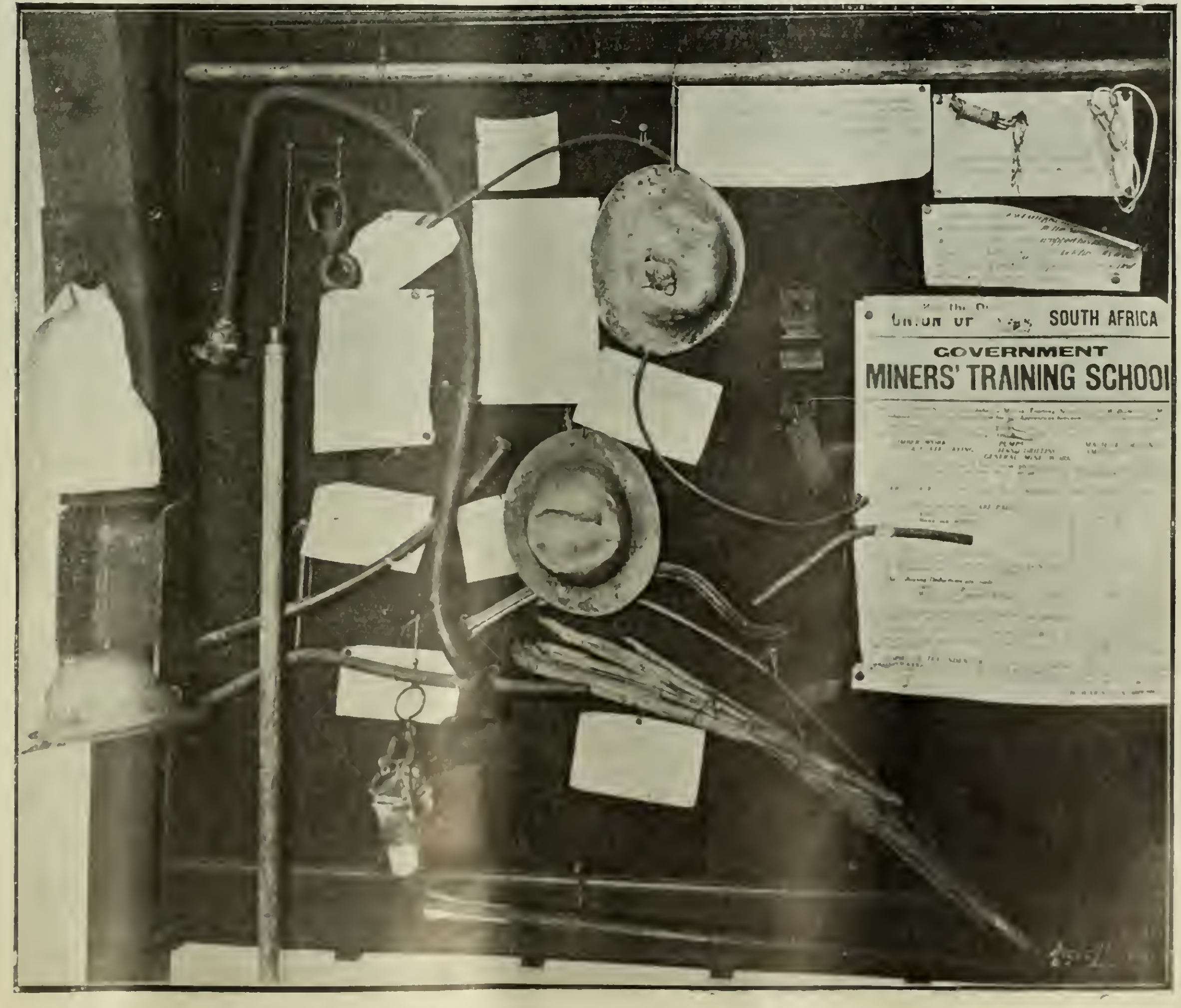
SPECIAL MINING EXHIBITION
AND
"SAFETY FIRST" SUPPLEMENT.

"Get the Safety Habit."

THE MINING AND "SAFETY FIRST" EXHIBITION.

By common consent the third annual Mining Exhibition, promoted by the Chemical, Metallurgical and Mining Society of South Africa, and opened this week, is pronounced an unqualified success. Elsewhere we deal with the aims and objects of the Exhibition, its educational and humanitarian value, and the extent to which the hopes of its organizers have been realized. It is of its humanitarian side, however, that the following pages mainly treat, and its educational aspect is only touched upon in so far as it impinges upon the former. For it cannot be denied that, however successful the Exhibition may be in other respects, its outstanding feature is the section devoted to the several aspects of the "Safety First" movement. It is not too much to say that the movement, even in its present stage, would amply justify a whole exhibition to itself, and its section certainly constitutes easily the most popular as well as the most valuable portion of the display at the Drill Hall. For that reason extended treatment is accorded in the following pages to the progress of "Safety First" on the Rand as a whole, and to the Exhibition of competitive devices and designs at the Drill Hall, which represents the first fruit and blossom of the new movement in our midst, as sedulously fostered during the past six months by the "Safety First" Committee of the Rand Mutual Assurance Co., Ltd. Next week we shall have something to say in regard to the efforts of local inventors in directions other than that of accident

THE MINES DEPARTMENT ACCIDENT MUSEUM.



A Striking and Gruesome Collection of Mute Witnesses to Many Mine Accidents on the Rand, got together by the Late Mr. J. S. Fisher, Inspector of Mines, and now Preserved by the Department.

prevention; and the exhibits of commercial firms will be reviewed in some detail. For this week, "Safety First" in all its phases more than suffices to fill our pages. The articles dealing with it will be found concise, comprehensive and authoritative. A brief account of the beginnings of the movement on the Rand leads off. This is followed by an interview with the Chairman of the "Safety First" Committee, Mr. H. Neuhaus, which gives the inner and intimate history of the scheme from its inception, and throws light on the personal forces behind it. Many of the points touched on by Mr. Neuhaus are elaborated in the succeeding articles. The record of devices already recommended to the mines affords tangible proof of the good work accomplished. The publications, already issued and in preparation by the Committee, are reviewed; and emphasis is laid on the fact that no foolish hesitation is shown in absorbing and utilizing all the best that has been done and published by similar organizations overseas. A full, illustrated description is included of the winning devices in the competitions promoted by the Committee in conjunction with the Mining Exhibition; and, in addition, the exhibits of those competitors whose success did not equal their enthusiasm are mentioned and described. In this connection we have to acknowledge our indebtedness to Mr. F. Rowland, the indefatigable secretary to the Exhibition Committee, and to Mr. J. F. Bilbrough, the managing secretary of the Rand Mutual Assurance Co., Ltd., who has done so much to advance the cause of "Safety First." The following pages represent an attempt to reflect and bring up to date the history of the growth of "Safety First" on the Rand. There never was a movement on these fields to which the publicity of our columns was more gladly given. Indeed, publicity is now alone wanting to complete and crown the success of the movement. To know it is to support it.

THE "SAFETY FIRST" CAMPAIGN ON THE RAND.

Review of Its Rise and Recent Progress—All the Groups Co-operating—Lessons from Other Countries—Successful Publicity Methods Adopted.

One of the most healthy signs of the times is to be found in the fact that the mining industry decided some time ago to embark upon an organized "Safety First" campaign. Individual mines and certain groups have long been striving to bring down the accident rate, and the columns of the papers—our own included—have teemed with more or less academic contributions on the subject. But hitherto a general co-ordinated movement has been lacking. That need the Rand Mutual Assurance Company, acting in concert with representative consulting engineers and mine managers, recently set out to meet. The names of the chairman and members of the sub-committee appointed to deal with the matter, printed in this issue, afford a guarantee of the earnestness with which the work is undertaken. All are imbued with the utmost enthusiasm for the task they have in hand, and they have also wisely secured the sympathetic co-operation of the Mines Department and the controlling houses. The Rand Mutual Assurance Company is, of course, peculiarly fitted to initiate such a concerted movement, and, as the official information imparted to us makes plain, it has at its command a vast amount of invaluable information that cannot fail, when carefully co-ordinated and concisely conveyed, to prove of inestimable service in the coming campaign. There is no doubt that the combined experience (in regard to accidents) of some fifty working companies on the Rand, apart from others outside, which is concentrated in that office will provide a useful volume of experience, which is capable of being used to endeavour to avoid at least some of these accidents occurring at all, or so frequently, in the future, and whatever deductions can be drawn from one mine's or one group's experience will be made available for the benefit of all.

Mine Managers' Co-operation.

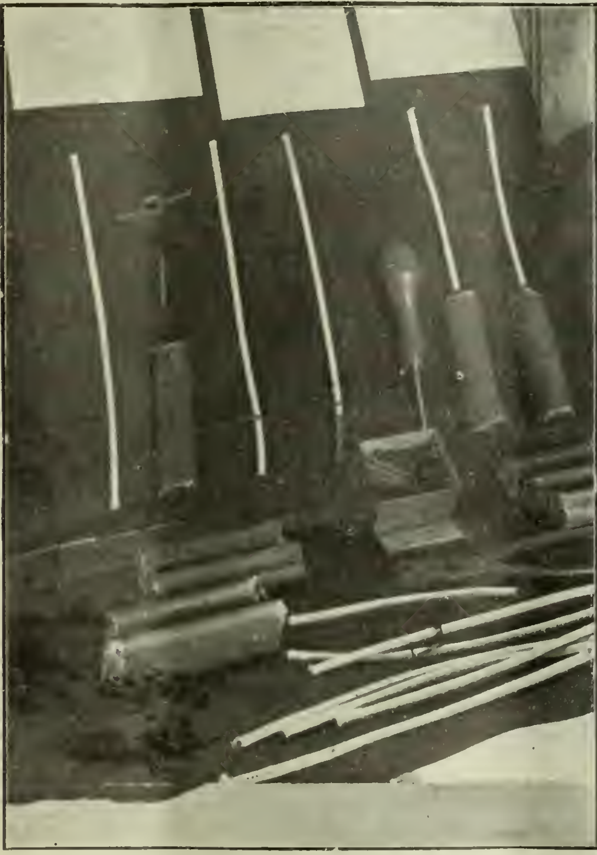
Mine managers will, of course, readily realise that the endeavours of the new body are directed towards assisting them in the work they are in charge of, that the object is a good one, and that by systematic and persistent endeavour real improvement can be effected, especially if white employees are induced to think of their own and of others' safety, to use the safety appliances at their disposal, to obey those rules which are made for the express purpose of preventing accidents, to see that those under their charge do the same, and that native labourers are looked after in this respect with particular care, and above all to use common sense and avoid unnecessary risks. Efforts will be made to classify dangerous practices which should be guarded against even although such practices have not recently caused any actual personal injuries to mine employees. Details of the "Safety First" movement in the United States will be circulated and other communications, pamphlets, etc., are under consideration. From several countries, in addition to the States, other lessons can, of course, be drawn; and indeed a notable sign of the times is the growth of the "Safety First" movement in modern industry.

A Publicity Campaign.

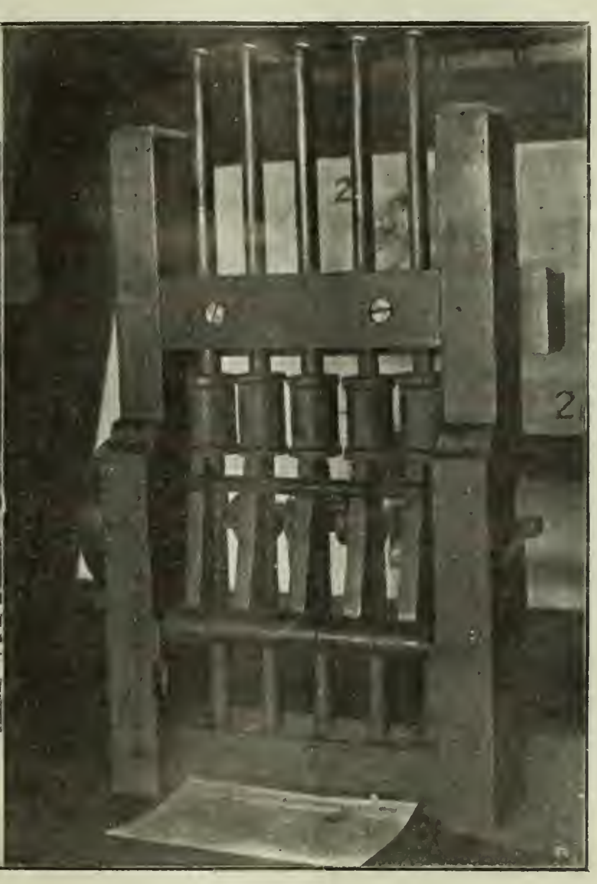
Fortunately the progress of all such movements can be materially aided by the publicity afforded by the Press; and recognising this, the promoters of the campaign on the Rand are preparing to avail themselves fully of the facilities which the papers will, no doubt, be only too happy to offer. For our own part, we do not propose to content ourselves merely with the publication of an occasional semi-official communication on the subject. With the promoters, we recognise that reiteration is the secret of conviction, and that if the men on the mines are to be educated up to the possibility of reducing accidents on these fields, they will have to submit to a steady and continual stream of information, advice and exhortation which cannot fail in the end sub-consciously—to use the term of the Chairman, Mr. Neuhaus—to produce the desired effect. For this reason we have called the movement "a campaign"; and for this reason we shall devote space each week to seconding the efforts of its protagonists. "Safety First" is to be the new motto on the mines of the Rand. Safety before false economy and deceptive efficiency. Safety before "speeding up" or the very appearance of "speeding up." Safety for white men and for natives. Safety in every department and in every circumstance. Plainly, here is a great reform—indeed, since the evil of phthisis was first strenuously tackled, to us quite the greatest and most commendable step begun since the Rand seriously undertook the task of reforming itself.

Recent Progress of the Movement.

The success that continues to attend the progress of the "Safety First" movement on the Rand, and evidences of its many-sided activity will be found mirrored in the following pages. Details are given of the first fruits of the movement, in the form of descriptions of safety devices of an eminently practical nature. These have been examined and approved of by the Mine Managers' Association, and by that body passed on to its members on the Rand. The "Safety First" Committee of the Rand Mutual Assurance Company, to whom the credit for the initiation of the movement is due, are leaving nothing undone to make progress worthy of their excellent beginning. The lay, as well as the technical, Press is freely employed to give publicity to their efforts; and the policy is being rewarded by the increasing popularity of the movement on the mines. The most ambitious step yet taken by the Committee is the decision to participate officially in the present Mining Exhibition, and the full list of prize-winners in the competitions, together with descriptions of the winning devices is given in this issue. An important interview with the Chairman of the "Safety First" Committee, Mr. H. Neuhaus, appears on another page. In other directions the Rand "Safety First" Committee is going about its work in a highly systematic way. Naturally, the co-operation of the Mines Department—whose inspectors have of late years been making a special study of mine accidents—is enlisted and progress of the "Safety First" movement in other countries is carefully noted.



Nowag's Safety Clip for Prevention of Misfires.
1st Prize, "Safety First" Competition, Class "A."



Dick's Safety Bar for Locking Stamps.
3rd Prize, "Safety First" Competition, Class "A."

Lessons from Oversea.

In the United States, for instance, the movement, though not many years old, has already made remarkable progress. A Museum of Safety has been established in New York and a Congress of Safety has gone deeply into this vital problem of applied conservation. Statistics of the metal mine accidents in the United States during the year 1912, recently published by the Bureau of Mines, are indicative of the success of the "Safety First" campaign. During 1912 the number of men killed in and about metal mines in the United States was 661, compared with 695 killed in 1911, so we may consider that 34 human lives were saved. This saving of life is well worth while, but the number of fatalities and accidents is still appallingly large. Mine managers, however, have awakened to the necessity for keeping their workings in better condition and providing more adequate safety appliances, so it is hoped that there will be a gradually diminishing death list in the future. Again, Mr. H. C. Hoover states that in Australia large sums of money have been spent to make the mines as safe as possible, and that these expenditures have invariably proved to be good business investments, resulting in increased efficiency and lower costs per ton of ore mined. The same result has followed from expenditures by the United States Steel Corporation and other American concerns. Though on the Rand the movement may be regarded as still in its infancy, the promoters are to be congratulated on the results already achieved. Owing to the efforts already put forth by the Mines Department the field for reducing accidents has been more limited than that, say, of the United States, when the "Safety First" campaign began there. Indeed, it may be said that the Rand movement began where that of the United States left off. The effort, however, is daily producing fruit, and with the expected fillip from the present Mining Exhibition and prize distribution a further big advance may be counted upon for the movement during this, the initial year of its existence.

G. A. & D. Robertson's Tube Mill at the Mining Exhibition.

This tube mill on a working scale at Stand 19 in the Mining Exhibition is about ready to run. It is, however, doubtful if the floor will be strong enough; if not, the mill and motor are to be removed outside the building and demonstration of this mill will be given during the incoming week.

HISTORY, AIMS, AND PROGRESS OF THE RAND "SAFETY FIRST" MOVEMENT.

The Chairman of the Committee, Mr. H. Neuhaus, Interviewed—Origin and Object of the Scheme on the Rand—Record of Success to Date—Work Already Accomplished and Contemplated—"Co-operation the Mainspring of the Movement."

Interviewed by a representative of this paper during the week, Mr. Hans Neuhaus, the Chairman of the "Safety First" Committee of the Rand Mutual Assurance Co., Ltd., furnished a valuable and interesting account of the origin, scope and progress of that excellent movement.

"The aim and object of the 'Safety First' campaign," said Mr. Neuhaus, "is to arouse interest in the movement, to educate opinion up to its importance, and to secure the co-operation of all classes on the mines in furthering the cause of accident prevention. Every grade of the labour force will benefit—it is not true that only the skilled are affected—and the two most fruitful sources of mine accidents, viz., falls of roof and drilling into misfired holes will be specially tackled."

"The movement owes its origin," proceeded Mr. Neuhaus, "to the accumulated experience of the Secretary and legal adviser of the Rand Mutual Assurance Co., Ltd., who were able to show very clearly that a large proportion of the accidents were due to preventable causes. Indeed, the movement is deeply indebted to these two gentlemen for their efforts. As a result the directors of that body—a mutual organization of all the Groups, except Randfontein—appointed the Safety First Committee in November last. Of course, the subject had been under consideration long before, and much had been done in a quiet way. But by that time we not only felt ready to go forward more boldly but also that the chances of success would be much increased by the formation of a special Safety First Committee on the lines adopted in other countries."

"Are all the groups assisting?" was asked.

"Yes—it is a group movement," was the reply. "The Committee of the Rand Mutual does not represent Randfontein, but that group is co-operating earnestly and enthusiastically in the good work, and is in no respect behind the others in supporting it. Moreover, we have secured the co-operation of the Consulting Engineers Committee and of the Mine Managers' Association. Indeed, these bodies welcomed the movement; and have greatly helped in extending and popularising it."

"And the mine staffs?" we asked.

"They, too, have given the idea their hearty support. Our aim is, of course, to educate not only the miners but all the mine officials up to the meaning of the movement. In that we promise to be completely successful."

"And as to progress generally?"

"Well," said the Chairman, "we cannot rush things, for co-operation is essential, and this we cannot obtain except through education, which tends to be a slow process. We have still to feel our way, though you can see from the record of work already done that we have not been idle. Already we can point to a respectable programme of effort. This comprises (1) many various safety devices examined and, through the Mine Managers' Association, the particulars of the best commended to the miner; (2) the preparation, publication and issue of various notices and warnings designed to advance the campaign; (3) the compilation and issue of a synopsis of the mining regulations in so far as they are concerned with danger to life and limb; (4) the series of lectures now being delivered on the West Rand at four centres by Mr. Archbold, Deputy Inspector of Mines, on 'Accident Prevention.' These promise to be highly successful, and in all probability similar advantages will in due course be offered to the rest of the Reef. And finally, (5) the prizes offered and support accorded to the Mining Exhibition this week to promote the 'Safety First' section of that undertaking. With this may be included the lectures on 'Safety First' to be delivered at the Exhibition. I may also mention, under this head, that we have under consideration the important question of a general danger signal. In fact, there is no means of attaining our end which we are not prepared to investigate, and if considered suitable, to adopt, for we feel sure that the advantages to be gained are incommensurable from every point of view, from that of the employee as well as that of the employer."

"Have you considered the adoption of the American idea of appointing special Safety Committees on the mines?"

"Yes, the matter has been discussed, but it is felt that the time is hardly yet ripe for taking action in that direction."

"Can you say that the movement is having any result so far?"

"Well, it is perhaps too early to attempt to express results in figures, but it is not too much to say that a new and different spirit is already visible on the mines, and that good headway has been made in arousing interest. A certain effect of the movement will be a reduction of accidents, and though the phthisis question is outside our scope it is clear that the display of more care on the part of the men in avoiding accidents will make them more careful generally and thus also aid the health battle."

"In conclusion," said Mr. Neuhaus, "I must emphasise that only with the united support of all the officials and men on the mines can the movement be made to realize its full possibilities. Indeed, co-operation is the mainspring of its success."

The Personnel of the "Safety First" Movement.

The Board of the Rand Mutual Assurance Company, which is composed of the representatives of the various groups who assure with it, is responsible for the "Safety First" movement. A sub-committee was formed by the board to deal with the whole subject, and the Committee of Consulting Engineers and the Association of Mine Managers have each delegated one of their number to act on such sub-committee, which is composed of Messrs. H. Neuhaus (chairman), J. Munro, A. French, H. A. Read, H. P. Fraser, Palmer Carter, and F. J. Trump. Mr. J. P. Bilborough is the secretary. The sub-committee has been assured by the Government Mining Engineer that it can reckon on his whole-hearted assistance and on that of his Department wherever it can be given.

Lectures at the Mining Exhibition.

Tuesday, May 19th, at 8 p.m. "Mine Accidents on the Witwatersrand," by Mr. A. M. Archbold (Deputy Inspector of Mines, Krugersdorp). Saturday, May 23rd, at 8.15 p.m.: "Rescue and Ambulance Appliances" (with Practical Demonstrations), by Dr. L. G. Irvine, M.D. (author of "First Aid in Mining"). Tuesday, May 26th, at 8 p.m.: "Safety Measures in Regard to the Use of Explosives," by Mr. Wm. Cullen, M.Inst.M.M. (General Works Manager, Dynamite Factory). Demonstrations of electric blasting will be given by Mr. F. W. Gindler Brown (General Manager of Meyer and Charlton G.M. Co., Ltd.). Dates and times will be notified in the daily Press.

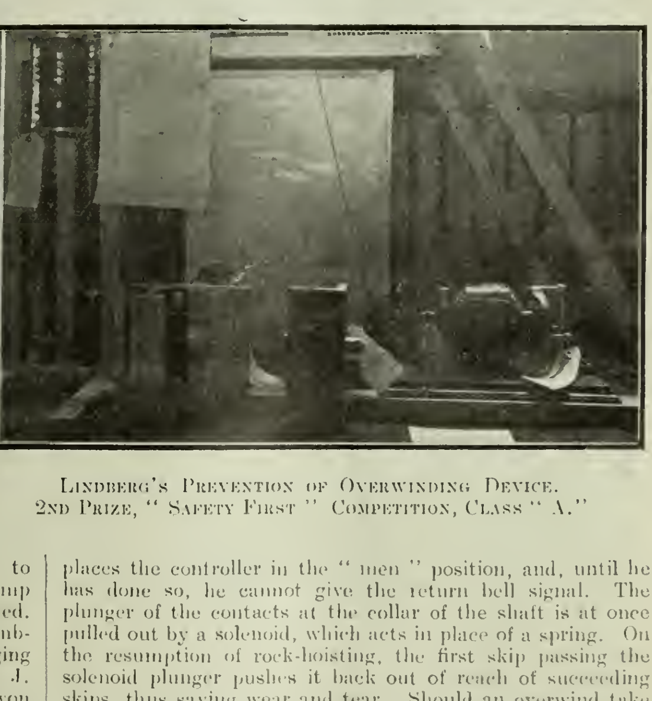
The best "Reef Traveller" is the *South African Mining Journal.*

THE WINNING "SAFETY FIRST" DEVICES.

Full Detailed Description of the Successful Exhibits.—The "Nowag Clip"—Lindberg's Overwinding Device—Carter's Flame Protector.

The report of the judges regarding the "Safety First" exhibits sent in for competition shows that as a result of this examination they have come to the following unanimous decision:—Class A.: The following prizes have been awarded: First prize of £25 and silver medal, No. 13, Mr. E. Nowag, Dynamite Factory, Modderfontein, for a safety clip for the prevention of misfires, etc. Second prize of £15 and bronze medal, No. 11, Mr. A. W. Lindberg, Ferreira Deep, Ltd., Johannesburg, for an overwinding device for electric hoists. Third prize of £10, No. 4, Mr. Otto E. Dick, Geldenhuis Deep, Ltd., Cleveland, for a safety bar with pegs for locking hanging stamps in position. The following are highly commended: No. 14, Mr. J. H. Ruthven, P.O. Box 6253, Johannesburg, for an improved automatic safety catch for mine cages; No. 10c, Mr. A. Job, Van Ryn Deep, Ltd., Benoni, for a safety hook for attaching winding rope to truck; No. 17, Mr. A. W. R. Schieder, 343, Jules Street, Malvern, for a safety explosives box. Class B.: The judges make no award under this section. Class C.: The prize of £10 for the best exhibit of an enclosed lamp is awarded to Mr. G. C. Carter, P.O. Box 94, Johannesburg. The lamp exhibited by Messrs. Ryan Bros. was highly commended. The judges regret that no suitable candle lamp has been submitted. Mr. R. N. Kotze was the chairman of the Judging Committee, which consisted of Messrs. P. Cazalet, F. J. Trump, W. Calder and J. E. Thomas. The devices that won the second and third prizes in Class "A" have already been recommended by the "Safety First" Committee in conjunction with the Mine Managers' Association, for adoption on the mines. They are both, therefore, fully described on another page, under the heading "Safety Devices Already Adopted on the Mines." The first prize winners in Classes "A." and "C." are described and illustrated below. Another account of the Lindberg device is also given.

Carter's Safety Lamp Device.
1st Prize, "Safety First" Competition, Class "C."



Lindberg's Prevention of Overwinding Device.
2nd Prize, "Safety First" Competition, Class "A."

The First Prize Winner—Class "A"

The first prize, secured by Mr. A. Nowag, of the Dynamite Factory, Modderfontein, is for a "safety clip for the prevention of misfires due to the pulling out of fuse and detonator from the primer. The clip holds detonator and fuse firmly in primer cartridge, preventing misfires which are frequently caused by the pulling away of fuse and detonator from primer cartridge while charging and tamping hole. It obviates the unsatisfactory method of tying with string." Such is the description of it given by the inventor. The clip is very small and simple. But it was, of course, the idea for which the prize was given. Mr. Nowag's great claim is that his invention "obviates the unsatisfactory method of tying with string."

Lindberg's Overwinding Device.

Mr. W. A. Lindberg, of the Ferreira Deep, was the winner of the second prize with an overwinding device for electric hoists. It has been designed to prevent overwinding accidents, either when hoisting men or rock. It consists of three principal parts, viz.:—(1) Electrical contacts in the headgear for rock-hoisting; (2) electrical contacts above the collar of the shaft for men-hoisting; (3) a three-point controller operated by the driver. On either the men or rock contacts being operated by the skip or cake, the main switch of the winder is opened by the "no-volt" coil, and the post-brakes are automatically applied. When rock is being hoisted, the controller-lever is placed in the "rock" position, and then only the contacts in the headgear are in circuit. When the signal is given to raise men, the driver places the controller in the "men" position, and, until he has done so, he cannot give the return bell signal. The plunger of the contacts at the collar of the shaft is at once pulled out by a solenoid, which acts in place of a spring. On the resumption of rock-hoisting, the first skip passing the solenoid plunger pushes it back out of reach of succeeding skips, thus saving wear and tear. Should an overwind take place when the controller handle is in either the rock or men position, the driver cannot again close the main switch or release his brakes until the handle of the controller is brought to the "off" position. A bell will then automatically ring until the skip has been moved from the danger-point, and the driver can then bring the handle of the small controller to the correct position for further operation. The advantages of the device are that the contacts are operated directly by the skip, which is independent of stretching of ropes, faulty indicators, etc., and is therefore applicable as well to Whiting hoists as to drum hoists. Four sets have been at work since February, 1913, so far with every satisfaction.

Carter's Flame Protector—First Prize, Class "C"

The device consists of a metal cylinder 2 1-16 in. outside diameter by 1 in. high; the top of the cylinder is cut away and wire gauze is fixed; the bottom is provided with a hole ⅝ in. diameter to allow it to fit over the burner protector of the Wolf lamp, this bottom may be perforated or covered with gauze. Three openings are cut in the periphery of the cylinder to allow the light to penetrate, the metal being cut and folded in such a manner as to form slides or sashes into which mica sheets are fitted. Approximately the front panel, which is twice as wide as the side panels, is the same width as the metal left at back of cylinder to act as reflector. A clip is rivetted on to this reflector portion by means of which it is attached to the reflector bracket of any Wolf lamp. It is necessary to make provision for re-lighting in the event of the flame being extinguished by concussion from blasting in the vicinity; for this purpose the right hand side panel should be used, and a sketch is shown of the small hinged door (mica covered): as an alternative this mica might be fixed in a metal frame and made to slide in top and bottom sashes towards the reflector clip. A further addition is shown on sketch of a tin cap (asbestos protected) and method of fixing. The whole device is packed in a tin cannister of such size that the protector does not shake about: this enables the device to be kept in the pocket or tool box without damage. Mr. Carter has arranged with Mr. Herbert Ainsworth, of the Corner House, to have the protectors manufactured, and placed on the market as soon as possible, as he realises that the simplicity and cheapness of his attachment will probably create for it a ready demand.

THE "SAFETY FIRST" COMPETITIONS: EXHIBITS DESCRIBED.

Brief Account of the Thirty Devices Entered for the Special "Safety First" Prizes.

THE exhibits entered for the prizes offered by the Rand Mutual Assurance Co. are the feature of the Mining Exhibition. The prizes, it will be remembered, were [illegible] for the best exhibits of a Safety Device, Appliance, or Method of Procedure, the bona-fide idea of the exhibitor, and must be of practical value for the purpose of preventing accidents to workers, or minimising the effects of such accidents, in or on mines, and must be such as have not hitherto been in general use. Class A.—First prize, £25 and silver medal; second prize, £15 and bronze medal; third prize, £10. Class B. [illegible] to commercial firms and agents.—First prize, silver medal; second prize, bronze medal. The following entries were received:—

Mr. Robert Brown, Germiston Main Reef G.M. Co., P.O. Box 191, Germiston: A safety device for use on skips in incline or vertical shafts (model of skip with device attached).—Safety catches, which, on the rope breaking, are actuated by a spiral spring in a boss attached to the distance piece of the bridle of the skip, to catch on to the timber framing in the shaft.

Mr. J. P. Carroll, 3, Rand Buildings, Avenue Road, Fordsburg.—(a) Safety device for the prevention of accidents in shafts, lifts, and the like (drawing).—The device is worked by means of clutches connected with rope tackle, which, when hoisting rope breaks, causes the weight of cage to draw clutches in position against face of guides, thus gradually stopping falling cage. (b) Safety device for the prevention of accidents in shafts, lifts, and the like.—When disconnection occurs two cams are pulled down by a spring, which forces safety catches to grasp sides of guides, thus gradually stopping descent of cage.

Mr. William Daly, Village Deep, Ltd., P.O. Box 1411, Johannesburg.—Model of cage with safety catch device.—Upon the fracture of rope an instantaneous grip is secured between the runners and the device fitted on top of cage, which is brought to rest without shock by a frictional grip set up between the guides and runners.

Mr. Otto E. Dick, Geldenhuis Deep, Ltd., P.O. Box 54, Cleveland.—A safety bar, with pegs for locking hanging stamps in position.—This device is intended to prevent hanging stamps from falling or being forced from stamp supports and injuring men whilst making renewals or repairs, also a safeguard against the stamps which are under repair being dropped. (Third prize.)

Mr. R. M. Dunn, City and Suburban G.M. Co., Ltd., 6a Nourse Street, Troyeville.—An filter to be attached to rock drills to purify air after it leaves machine, thus preventing miners' phthisis. The device is intended to purify the air leaving the exhaust of the machine, to act as a silencer, and to prevent diffusion of dust.

Mr. J. M. [illegible], Brakpan Mines, Ltd., Box 3, Brakpan.—Adjustable brake to check the speed of [illegible] pans travelling by their own momentum.

Mr. P. H. [illegible], P.O. Box [illegible], Maraisburg.—Device to draw the attention of hoisting engine drivers to their duties. An indicator dial to be operated by driver to remind him of duty in hand.

Mr. J. [illegible], New Primrose G.M. Co., Ltd., P.O. Box 193, [illegible].—[illegible] box [illegible] for the safe storing of explosives [illegible].

Mr. [illegible] W. [illegible], Ferreira Deep, Ltd., P.O. Box 1021, Johannesburg.—[illegible] for prevention of accidents to trammers, with drawing.

Mr. A. J. [illegible], Van Ryn Deep, Ltd., P.O. Box 225, Benoni.—(a) Safety arrangement attached to [illegible] device for use when lowering or [illegible] [illegible]. Drawing only. (b) Arrangement attached to quadrant of [illegible] to prevent driver pulling reverse [illegible]. Drawing only. (c) Safety hook for attaching [illegible] rope to truck. [illegible] (Highly commended.) (d) Safety brake attached to [illegible]. Drawing. (e) Overwinding prevention device for use [illegible] and to act also [illegible]. Drawing. (f) Safety arrangement attached to overwinding prevention device for use [illegible]. Drawing only.

Mr. A. W. [illegible], Ferreira Deep, Ltd., P.O. Box 1021, Johannesburg.—Overwinding [illegible] for electric [illegible]. (Second prize.)

Mr. F. [illegible], Germiston [illegible] G.M. Co., Ltd., P.O. Box 191, Germiston.—Safety [illegible] to prevent [illegible] from [illegible] off [illegible] when men are working [illegible]. [illegible] only.

Mr. E. [illegible], [illegible], Middelfontein.—A safety clip for prevention of [illegible] the pulling out of fuse and detonator from the primer. The [illegible] detonator and fuse firmly in primer cartridge, preventing [illegible] which are frequently caused by the pulling away of fuse and detonator from primer cartridge whilst charging and tamping hole. Obviates unsatisfactory method of tying with string. (First prize.)

Mr. J. H. Ruthven, P.O. Box 6253, Johannesburg.—Improved automatic safety clutch for mine cages.—A working exhibit with half cage and 30ft. vertical rails. Designed to stop cage gradually and to avoid shock. The device can be adapted to incline shafts. (Highly commended.)

Messrs. Ryan Bros., New Primrose G.M. Co., Ltd., P.O. Box 193, Germiston.—"Safety first" dynamite box.—This box offers no attraction as a resting place, and will not hold a lamp.

Messrs. H. E. Rygor and Wiesholtz, P.O. Box 290, Benoni.—Safety device for skips running in inclined shafts.

Mr. A. W. R. Schieder, 343, Jules Street, Malvern.—A safety explosive box for storing explosives underground.—This has two lids, the inside one opening right to back of box, necessitating removal of lights and material on top of box before it can be opened. (Highly commended.)

Mr. W. H. Shoobert, Verona House, Plein Street, Johannesburg.—Self-binding clutch for cages, preventing runaways and falling cages on mines. Small model of shafting and cage. On rope breaking the clutch, actuated by the weight of cage, immediately binds on the runners of the shaft.

Mr. R. J. Smythe, Ferreira Deep, Ltd., P.O. Box 1021, Johannesburg.—One water tap for high or low pressure, with safety device to prevent persons placing mouth against nozzle (common occurrence underground), thus preventing tuberculosis infection.

Mr. A. W. Stockett, P.O. Box 5593, Johannesburg.—Safety door for multiple deck man cage.—By the use of this device all decks of cage are under control of man in charge of lower deck, and until doors of upper decks are properly closed it is impossible to close bottom deck door. The closing of bottom door automatically locks upper doors, which cannot be opened until the bottom door has been opened by man in charge.

Mr. J. H. Veasey, New Kleinfontein Co., Ltd., P.O. Box 2, Benoni.—Device (and method of using same) for securing greater safety for miners when blasting in isolated vertical or steeply inclined winzes.—This device enables miners to disconnect all fuses from their primers, should the necessity arise, and if a "running fuse" occurs the first explosion will disconnect all other fuses from their primers.

Mr. R. M. P. Williams, Geosberg G.M. Co., Ltd., P.O. Box 16, Knights.—Safety automatically emptying car.—The contents of car are emptied by bottom discharge, and do not require hand-tipping, the discharge automatically opening and closing and locking and unlocking. It ensures saving in time and labour, safety in operation, and in cost of manufacture.

Mr. E. H. Eeles, 1, Fleming Street, Capetown.—"The Scout" device.—An electrical instrument for indicating and signalling movements of caving or shifting ground. Pressure of ground in stopes, drives, etc., causes compression of a spring, which by an electrical contact rings a bell and shows a red light, thus warning those in vicinity of danger.

Safety First Exhibits.—Class C.—Prize of £10 for the best exhibit of an enclosed lamp, suitable for use in metalliferous mines by miners whilst handling explosives.

A.E.G. Electrical Co. of S.A., Ltd., P.O. Box 1129, Johannesburg.—(a) Miner's safety lamp. (b) Miner's safety lamp.

Messrs. Blane and Co., P.O. Box 435, Johannesburg.—The float electric hand lamp. "Miner" type, "Police" type, and "Household" type.

Mr. G. G. Carter, P.O. Box 94, [illegible].—An attachment for enclosing the flame of an ordinary acetylene hand lamp, for use in mines by miners whilst handling explosives. (First prize.)

Messrs. A. H. Johnson and Co., P.O. Box [illegible], Johannesburg.—Edison electric safety lamp.

Mr. H. B. Johnson, 141, Becket Street, Hillbrow.—Safety candle saving lamp.—A simple and cheap device which effects a saving of 75 per cent. of candles, and by the light of which explosives can be handled with perfect safety.

Mr. W. Muir, Crown Mines, Ltd., P.O. Box [illegible], Crown Mines.—A safety lamp for use when transporting explosives underground.

Messrs. Ryan Bros., New Primrose G.M. Co., Ltd., P.O. Box 193, Germiston.—(a) Enclosed lamp.—A safety protector to be attached to any lamp or open flame. (Highly commended.) (b) Safety protector for acetylene lamps, candles or naked lights for use whilst handling explosives.—A device for attachment to any lamp or open flame, so constructed that no flame can reach explosives.

"SAFETY FIRST" AND THE CARE OF THE EYES.

How the Wearing of Glasses Prevents Serious Accidents.

THE photographs reproduced below, showing how the wearing of glasses has preserved many from serious injuries to the eyes, speak for themselves, and convey a striking object lesson in the efficacy of safety measures. A leading eye-specialist favours us with the following:—"A large number of men employed upon the mines lose the sight of one or both eyes every year, and in the majority of cases it can be avoided. In nearly all these accidents the injury is inflicted by a fragment of rock or metal. Men employed as miners, rock drill sharpeners, masons, smiths, carpenters, machine makers, metal turners, etc., are all peculiarly liable to such accidents. These injuries can be avoided by the use of glasses, but there is an extraordinary prejudice against their use amongst working men. The spectacle frame may be of metal, except in those occupations involving exposure to great heat, when they can be made of horn or tortoise shell, and the lenses should be of a large size in order to protect the eye. Where the work is liable to result in the deposit of perspiration on the inner side of the glass, as in the case of drill sharpeners, the difficulty can be overcome by smearing the glass with a transparent grease, such as "lasin"; this prevents the deposit and does not impede the sight. Accidents occurring owing to the wearing of glasses are very unusual, and when they do occur, the injury results in small cuts about the lids and face, and not of the eyes."

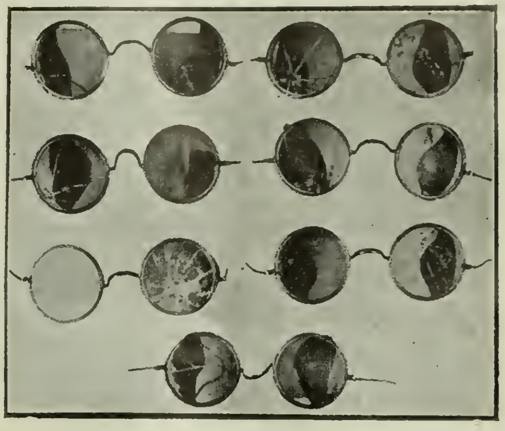
Specimen page of monthly bulletin of the United States Steel Corporation:—

C. BOLISKI, Chipper in Foundry Yard, Gary, March 1, 1913.

IS HE HAPPY?

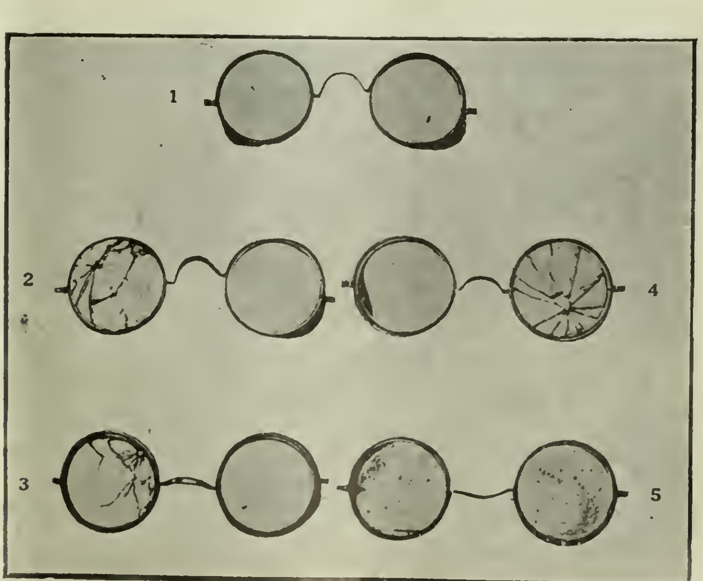
Yes! He wore his goggles while chipping, and saved his eye when a chip flew from casting and struck them.

SEVEN EYES SAVED AT SOUTH.



Seven goggles broken by chips at South Works' Foundry Chipping Yard during March, 1913.

FIVE PAIRS OF GLASSES WHICH NO DOUBT PREVENTED FIVE SERIOUS ACCIDENTS.



These goggles were worn by men in this plant. Nos. 1, 2 and 3 were broken by flying chips. No. 4 was broken by concrete when chipping on the base on one of the stacks at the new boiler house. No. 5 was burned by molten metal: This pair was worn by a man operating the bull ladle in the Grey Iron Foundry. What would have happened if these men had not been wearing goggles? Think it over. Ask your foreman to supply you with goggles.

(Above was placed on Bulletin Board at Kewanee Plant National Tube Company.)

ACCIDENT PREVENTION DEVICES ALREADY ADOPTED.

First Fruits of the Work of the "Safety First" Committee of the Rand Mutual Assurance Co., Ltd.—Full Description of the "Lindberg" and "Dick" Inventions.

PARTICULARS of the following safety devices, already recommended by the Mine Managers, through the Mine Managers' Association, have been supplied by courtesy of the Prevention of Accidents Committee of the Rand Mutual Assurance Company, Ltd.:—(1) Dick's device for mill stamps. (2) Overwinding devices: (a) Philip's, as illustrated and described in the Government Mining Engineer's report for 1912, pages 123/4; (b) Lindberg's—description given below. (3) Handles on trucks for tramming: These handles have been in use for many years by Mr. R. Raine, both on the New Heriot and the Village Main Reef, who states:—"The handles are undoubtedly a decided advantage in saving accidents, to boys' fingers, when pushing the trucks along the drives and more especially when trucks are over-loaded." The cost of labour and material is given on the drawing as being 2s. 8d. per truck. With regard to the overwinding devices, Messrs. Bartle & Co., Box 1355, Johannesburg, are the sole selling and manufacturing agents for both. The cost of Lindberg's devices is £65 net for double compartment shafts, fitted with runners, or rails, or on the incline. For single compartment shaft, £40 net. These prices do not include cost of erection but include all royalties. Messrs. Bartle & Co. write that they do not think it advisable that the mines themselves should manufacture the device, as the making of the various parts and sections will be under the patentee's supervision, in order that the workmanship and material may be commendable to the idea. The cost of Phillip's device is £23 10s. complete per engine, delivered from stock or 14 days from date of order. This price excludes cost of installation, but includes royalties.

DICK'S DEVICE FOR HANGING UP MILL STAMPS.

This is a device which has been prepared by a practical mill man, who has had many years' experience on these fields and who received a severe injury to his hand some time ago as the result of a stamp falling accidentally on it. The locking bar has not necessarily to be fitted to each set of five stamps, as it is interchangeable and can be moved to whichever battery it is desired to hang up, provided that the necessary rest sockets are attached to each King post. The bar can be made of any cheap material such as old boiler tubing, provided it is sufficiently strong. As this device has been got out in response to an appeal to employees by the manager of the Geldenhuis Deep, Ltd., at the instance of the Prevention of Accidents Committee of the Rand Mutual Assurance Co., Ltd., it is put before the Mine Manager's Association on the understanding that for each of such mines as the suggestions given in the drawing are acted upon, a bonus of £5 shall be paid to Mr. Dick by the company using the device; such payments may be made either through the Association of Mine Managers or the Rand Mutual Assurance Co., Ltd. It is considered only fair that such ideas as this are generally given out to the industry, without being patented, in response to appeals for suggestions on safety devices, should be encouraged. If they are worth putting into practice the small bonus to the originator referred to above will be an inducement to others to bring forward their ideas.

LINDBERG OVERWINDING DEVICE.

Mr. J. H. Ridler thus reports on the Lindberg overwinding device:—The Lindberg overwinding device is not the same as the Philips' safety device, and neither does exactly what the other does. The Philip's device is not a "preventative," but it gives a loud warning to the driver in either of the following conditions, namely:—(a) When the hoist is standing with the skip at the surface or in the tip, if the driver merely moves the lever in the wrong direction, i.e., to wind it when he should lower; (b) if the driver brings his skip up past a predetermined point below the collar of the shaft, without shutting power off. The Lindberg device is an overwinding preventer, as it automatically shuts the power off and applies the brakes if the skip is brought up to a predetermined point, either above the collar of the shaft when hoisting men or above the tipping point when hoisting rock. To make the Lindberg device work for either men or rock, a hand controller has to be moved by the driver to "men" or "rock" according to the signals given from below. The Lindberg device will not give any warning to the driver if he should put his lever in the wrong direction until the skip has actually moved, and then power is cut off and the brakes applied. The Philip's device gives an actual warning to the driver and gives him a chance to correct his error before the skip moves. If the driver is bringing his skip up the shaft and has not cut the power off at the right point, the Philip's device gives him warning before the skip reaches the collar of the shaft, but with the Lindberg device the skip would come right on and go right up into the tip (if hoisting rock) before the overwinding device would work, and then the brakes would go suddenly on. I think each device has its own proper field, and what we want is a judicious combination of the two. The Philip's arrangements can easily be combined with that of Lindberg. (1) I think the Lindberg device is an exceedingly good one. (2) At present it is only installed at the Ferreira Deep. (3) The cost is somewhere between £50 and £70 per winding engine to instal. (4) I do not know of anything better to carry out the particular work which it does, but as I stated above, I think it should be combined with the Philip's to make an entirely satisfactory article.

THE PHILIP'S SAFETY DEVICE.

In this arrangement a small control switch, of the rotating drum pattern, is installed on or under the driver's platform and worked direct from his control lever. Mounted upon the indicator spindle at the back of the dial, is an insulated disc carrying a contact piece, which engages with two spring contact fingers fixed in any predetermined position to give a warning signal when required. The signal usually used is an electric hooter, in order to be clearly distinguishable from the ordinary bell signals. This method of signalling can be worked from any low voltage system available, such as signal batteries or lighting circuit. The operation is as follows:—When, in what may be called the danger zone (which may be taken as a point a few feet below the collar of the shaft up to the tip), the brass contact on the insulated disc on the depth indicator is making contact with the two brass springs above mentioned immediately the driver's lever is moved from the neutral position, to such a position as would move the skip or cage upwards, the circuit is completed and the warning signal given.

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THE PUBLICATIONS OF THE “SAFETY FIRST” COMMITTEE.

Issue of Important Pamphlets—Some Points of General Application—“The Mining Regulations Without Tears”—More Lessons from the States.

Another step in the progress of the Rand “ Safety First ” campaign was marked by the recent issue of an important pamphlet containing some lessons from the United States. In a foreword to the brochure, it is stated that last year (1912) in Transvaal gold mines there were 2,296 accidents, 333 white persons were injured (including 54 killed); the same figures for natives were 2,478 injured (including 805 killed). The accident rate for metal mines is much the same here as it is in the United States. In 1911 the Transvaal rate was just above and in 1912 (a record good year) is stated to be below the United States of America; both countries, however, are far above the British rates. The articles which follow show how an American Corporation reduced accidents to its workmen by 43 per cent in five years, and although the details given relate to workshops the general principles apply equally to mining. A pamphlet issued from the Bureau of Mines, Washington, U.S.A. (a Government document, mark you) uses these words in its preface:—“ In discussing the causes of such accidents as those from falls of roof and of coal little is to be gained by declaring that the miners or that the mine owner is mostly to blame. As a matter of fact, neither the mine owners nor the miner acting alone can entirely prevent such accidents. Each has his part to do; each is responsible for doing his part well. If the miners will co-operate with the mine owner and the mine owner will co-operate with the miner in an earnest effort to prevent these accidents, many lives will be saved. Let both the miner and the mine foreman co-operate with the inspectors in their efforts to safeguard life. Let ‘ Safety First ’ be our motto and guide in practice as well as in theory.” The foreword adds:—Can't we try to do the same? It is quite possible if all will help! Anyway, it pays you to do your work the safe way.

Conserving the Worker.

The body of the pamphlet consists of an extract from *The Engineering Magazine* (New York) of July, 1913, entitled “ The Conservation of the Worker,” by Arundel Cotter. By way of introduction the editors point out:—“ The ‘ Safety First ’ movement is now being propagated into all forms of employment which involve elements of danger. Railroads throughout the country are taking up and repeating the slogan. Large—and small—industrial establishments are realising the value of their workmen, and are bending every effort toward conserving that value. The United States Steel Corporation, the leading exponent of the movement, as Mr. Cotter points out, is endeavouring: First, to instil the germs of caution into its workmen; and second, to render its machinery, as far as possible, ‘ fool proof.’ ” The writer of the article quotes some American statistics and refers to liability laws introduced by legislators, and then proceeds as follows. (We quote a few noteworthy passages.) “ While legislators have been groping about with more noise than results, it was left to the employer to find the real solution of the problem. The movement, let us believe, started from purely humanitarian motives, but as it grew the men who tried it began to realise that, just as the death of a slave meant a loss to his owner, the death of a trained workman meant the breaking of a well-oiled cog in the employer's business machine, and that it was cheaper to prevent than to repair. Thus common business foresight helped the movement along, and the whole spirit of the movement is that it is better, and cheaper, to pay for safety devices than to pay damages afterwards. With these two arguments, the appeal to the heart and to the pocket-book, the “ Safety First ” propaganda has grown steadily year by year, spreading from industry to industry, and is now beginning to make itself felt and recognised by the whole industrial world.

Recognising that care on the part of the workmen is more than half the battle, the committee begins its work with the man applying for a job at the steel mill. The slogan “Safety First ” is kept before the worker even before he is introduced into the plant At the several employment offices of the corporation's subsidiaries there are large signs warning the would-be steel maker that every man is required to be careful, not only for his own safety but for that of others; and these signs are printed in a number of languages. Lest the employee should forget these warnings, large signs, illuminated brilliantly at night, are posted over the entrances to the mills, and these constantly repeat the warning to the worker as he goes to his labours. These illuminated signs were suggested by one of the workmen and the suggestion was eagerly adopted, the man being rewarded liberally for his idea. The wording, or “ mottoes,” on the signs are changed from day to day. A few of the most striking are given:—

“ The prevention of accidents and injuries, by all possible means is a personal duty which everyone owes, not to himself alone, but also to his fellow-workmen.”

“ Remember, it is better to cause a delay than an accident!”

“ Let every employee make himself a committee of one, to prevent some one accident.”

“ Look out for the other man! You might hurt him.”

“ Warn a man danger is near. He may know all about it; if so, no harm is done; if not, you may save him from injury.”

“ Foremen—Carelessness is dangerous! If workmen insist on being careless, discharge them.”

These are only a few.

A prime principle of the Safety Committee was expounded by one of its members thus: “ Not only in an ounce of prevention worth a pound of cure, but rather let us have a pound of prevention than an ounce of cure.” And that this is lived up to as far as can be, is evidenced by the fact that in one building a sum of $32,500 was spent to prevent accidents to lamp trimmers and window cleaners alone.

What has already been done by some companies demonstrates clearly that an appreciable proportion of the present human waste from accidents is unnecessary. The employer should take advantage of every means at his command to stop it and, what is just as important, the worker himself must be educated to use the means provided. But it is not a matter that should be left entirely at the option of the employer, and the use of safety devices and other precautions should be made compulsory. A national campaign would inevitably accomplish far more than can be done by any individual employer, or employers working together, and it would result not only in saving to the nation an incalculable sum annually, but it would mean less suffering, less misery, fewer desolate homes.

Learning the Mining Regulations “ Without Tears.”

It is intended by the Rand “ Safety First ” Committee to get out and distribute free of cost various pamphlets dealing with the subject, and in particular a synopsis of the Mining Regulations referring to each class of workmen, the intention being that the miner, for example, shall not necessarily have to wade through some 300 Regulations, couched in legal language, in order to find out what particularly affects him. These pamphlets will be issued both in Dutch and English. It is intended particularly to bring home the necessity of also making the natives acquainted with the chief measures which they must take to ensure their own safety.

Example from Oversea.

It is a hopeful augury for the success of the work to be undertaken that both in America and Germany the Government, not to speak of private institutions, have found that the spending of money on concerted measures with the same object in view has achieved considerable success. In various centres in Germany as well as in America “ Safety First ” Museums are maintained, while the Bureau of Mines of the United States is constantly issuing circulars addressed to the miners in plain language, pointing out the risks of various branches of their work, and giving hints as to the best methods for their avoidance. The expenditure of money by the Government for this purpose is evidently based on the importance of conserving the State's best asset—its workmen.

The Duty of the Workman.

Perhaps as striking a feature of these publications as any other is the emphasis which is laid on the duty of every workman to report immediately to his superior not only any danger points which he may see but also any breach of the regulations which he may observe a fellow-workman committing. Indeed, in Newfoundland so much stress is laid upon this duty that the workman who does not comply with it is considered to be an accessory to the commission of the offence. If the same spirit could be introduced on these fields it is felt that the number of accidents would very soon show a considerable decrease, for, after all, the main object of the sub-committee is to drive home to the workmen employed here that a large proportion of the accidents, as is clearly shown by official statistics, is due to carelessness, ignorance and recklessness for their own safety. The "Safety First" movement is in fact one which is mainly in the interest of the workers themselves, for, while it is true that the mining companies, if the number of accidents were reduced, would save a considerable amount of money, it is clearly of vital importance to the workman who, in the event of an accident, suffers, and who loses, if not his life, possibly his means of earning a livelihood.

Accident Prevention in the United States.

Safety Committees have been organized for practically every operation throughout the subsidiary companies of the United States Steel Corporation; 4,678 employees were members of these committees during 1912. The personnel of these committees, especially those made up of workmen, is changed periodically in order to extend the individual interest in safety. Since 1906, when the Corporation actively took up the work, approximately $5,000,000 has been spent on safety work, and it is felt that to a large extent those accidents for which the employer is responsible have been eliminated. An analysis of the causes of accidents shows that a large proportion of them are due to the carelessness of the workmen. In an endeavour to eliminate these accidents a very active campaign of education was started by all of the subsidiary companies some time ago. Entertainments are given at the different plants or mines. All employees and their families are invited. Typical unsafe practices are shown in contrast with the proper and safe method of doing the work. Motion pictures and lantern slides are employed, and are relieved by music and other things of an entertaining character. Twenty-one such entertainments were given by one company this year. Another company, in conjunction with a public service company, entertained at different times some 8,000 school children. They were shown moving pictures of the dangers of the street and their play. It is believed that all of this work is beneficial in stimulating the interest in safety. Many other plans have been inaugurated, the most recent of which is the giving of monthly prizes to each man in the departments having the best records for safety. One company has established a bonus plan which applies to all foremen; and cash bonuses, based upon the per cent. reduction of accidents in each particular department, are paid at the end of the year to each foreman. In some companies, suggestion boxes are located at convenient places throughout the plant for the convenience of all employees who are not members of committees but desire to make suggestions. Prizes are awarded periodically to those making the best suggestions.

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WORLD-WIDE PROGRESS OF "SAFETY FIRST" MOVEMENT IN MINES.

Some General Guiding Principles and Common Difficulties—Definition of an Accident—Limitations of Mechanical Devices—Risks of the Majority—"The Sense of Personal Responsibility."

The "Safety First" movement began on other mining fields before its appearance on the Rand, and it is possible for us, in several directions, to profit from their experience. All over the world, but particularly in the United States, the need for better systems for the protection of men from accidents is being increasingly recognised, and the economic loss from preventable casualties is being appreciated by a continually growing proportion of employers. The economic loss includes not only payments to the heirs of those killed and to the injured and their attorneys and agents, but also the time lost by workmen during recovery from injuries. Many employers do not regard the loss of time of individual workmen with as much concern as others do. The prevention of accidents in mining can not yet be classed as a science. Those employers who have studied the subject have laid down certain fundamental principles upon which their methods of protection are based. A few employers have formulated sets of rules that they have distributed for the guidance of certain classes of employees, but all of these sets are incomplete and imperfect. To an important extent detailed statistical information upon which methods of prevention can be based is yet lacking.

DEFINITION OF AN ACCIDENT.

The fundamental question as to what may constitute an accident is defined differently by various mining companies. One manager may require from the mine officials a detailed report of any casualty, however slight, that delays the worker or that draws blood; another may consider no injury worthy of regard that does not come to the attention of the foreman or the shift boss. However, all companies in America have so increased the list of reportable accidents that statistics show an apparent increase in the number of casualties. Indeed, this result is used as an argument against the whole system of accident prevention, and against the necessity for expenditure for more extensive safeguards. In time this error will right itself, and the outlay of money that has been made by the mining companies for preventive devices will begin to show effects in a marked decrease in the number of accidents, and especially of serious and fatal ones. The mere diminution of all accidents is not as important as the lessening of fatalities and of time lost by reason of injuries. In these there is already a marked improvement.

SAFETY DEVICES PROTECT SKILLED MEN CHIEFLY.

The installation of mechanical safeguards is only the beginning of the movement for safety at mines. Out of the total number of men employed at one group, mechanical safety devices protect directly only 30 to 40 per cent., the proportion depending on the nature of the operations of the mine—whether the mine is of the open-pit or the underground type, whether mining only is done or mining and ore treatment combined, whether the mine is operated at high tension or under more normal conditions. Workmen who are protected by safety devices embrace largely men employed about machinery, and therefore men who are intelligent, such as electricians, engineers, carpenters, shop men, machinists, and locomotive and steam-shovel operatives. Of the total number of accidents, perhaps only 10 or 15 per cent. is affected by safety provisions.

HAZARDS OF THE MAJORITY.

No device can absolutely protect a man from the consequences of carelessness, recklessness, physical weakness, awkwardness, inattention, or ignorance. The hazard assumed by the 60 or 70 per cent. of mine labourers not especially protected is inherent to their occupation. In connection with these, the problem is one of education—signs, warnings, example, reiteration of instructions, and the awakening of the idea of personal responsibility are needed. The hazard to the majority is illustrated by the citation of a few simple, ordinary, and frequent casualties. A cinder in the eye may result in inflammation and subsequent blindness; a nail left sticking through a board may cause lockjaw; a hammer blow on a finger nail or even a scratch may result in blood poisoning; pieces of rock or frozen dirt thrown by a blast may fracture a man's skull; a heavy timber carried by several men may be dropped too quickly and fracture a man's foot; a signal may be disregarded by a man walking on a mine track, and a serious accident may result. There are very many trifling ways in which accidents may come, but the accidents themselves may be far from trifles. The mere neglect to report a hurt, so slight that it does no more than draw blood, may later result in grave consequences. It seems to be the consensus of opinion that indifference, carelessness, and ignorance lie at the root of the majority of mine accidents. Therefore these faults ought to be combated by an active educational campaign. Several of the more progressive mining companies, awake to the fact that a trifling injury may become a serious one, have made it a rule to have any happening reported that may, by a reasonable stretch of the imagination, be classed as injurious; they further require the injured person to drop his tools or cease his occupation and, if practicable, report to a physician provided for the purpose. As the "time" of the man so reporting continues during this preliminary examination, it is only natural that some miners take advantage of the provision requiring such examination, to the detriment of the employer.

SOME CONCLUSIONS.

In the pursuit of reform in conditions at mines, as elsewhere, there is the danger of going too far. The extremist for profit will view mine-safety expenditures with an eye to immediate costs of installation and operation, whereas the idealist will urge such a refinement of methods, such a thorough protection, and so wide-reaching a paternalism as will be unjust and as will instill too great confidence in the mind of the operative, and therefore produce carelessness. It is unnecessary to argue that there are inherent and unavoidable risks in industry. The fact is recognised by all except a very few unreasoning enthusiasts. Any system of safeguarding employees that minimizes their sense of personal responsibility tends to increase casualties. Many employers hold that safety precautions may be carried so far that this sense of personal obligation will not only be diminished, but that it will be entirely destroyed. The responsibility for preventable accidents lies, not with the employer alone, but with the employee as well. Both usually suffer through careless acts. No sentimental considerations, no effort to take a position where there can be no criticism of his zeal for safety, should cause one to forget that both parties are accountable and that they have duties equally important and urgent. Many employers of mine labour have taken every reasonable precaution to safeguard mines and machinery, and their study has been extensive along the line of the improvement of safety devices and the formulation of safety rules, in the light of actual daily practice. Sentimentality must not obscure the fact that carelessness, recklessness, and a disregard for orders put the workman in the class of the employer who makes no provision for safety but carries forward his operations with no attention to the obligations due his fellow men. Not only does the careless labourer imperil himself, but he endangers his fellows as well, and he may frequently nullify every appliance, device, and rule, upon which his employer may have expended great sums of money, much time, and anxious thought. Strict discipline is one of the requirements of the situation, for only by obedience and co-operation can the utmost good be obtained from expenditures for safety.

THE PREVENTION OF MINE ACCIDENTS ON THE RAND.

Mine Inspector Reviews All the Real and Alleged Causes of Accidents in so far as They Concern the Managements—Some Strong Criticism.

A LECTURE was delivered in the smaller hall at the Mining Exhibition, Johannesburg, last Tuesday night, by Mr. A. M. Archbold (Deputy Inspector of Mines, Krugersdorp) on the subject of "Mine Accidents on the Witwatersrand." Mr. R. N. Kotze (Government Mining Engineer) presided. Mr. Kotze, in introducing the lecturer, took the opportunity of congratulating the organisers of the Mining Exhibition on their work, and commended the attention of all to the Safety First Committee and their objects. The lecturer, Mr. Archbold, explained that he was delivering a course of lectures to miners, and he proposed that night to deal with the managerial side. He was in the position of the man on the fence who saw more of the game than those who were playing. In 1913 there were 2,345 accidents on the Witwatersrand mines, 808 fatalities, and 2,005 cases of persons being injured. The death rate was 3.66 per thousand. The ignorant native was not alone to blame for this, and while accidents could not altogether be avoided, it was the duty of everyone to reduce to a minimum the possibilities of accidents. An excess of economy meant more accidents, while an excess of safety meant a loss in economy. He attributed the number of accidents on the mines to speeding up, insecurity of tenure of officials and miners, the contracting system, the nomadic working population, carelessness and inexperience, and a lack of co-operation between the officials and the men to secure safety. He instanced how extra tube mills were put on to a mine with the result that there had to be extra shifts, the skips were run faster, and in the general rush there was a risk of increased shaft and other accidents. There was no time to cut the necessary safety pillars, and the miner had no time to render his working face safe or keep up the timbering. The directors could not be blamed for endeavouring to do the best for their shareholders, but if they could be got to co-operate with the engineers it would lead to increased safety. The greatest faults the lecturer found on the Rand were the inadequacy of the number of safety pillars and the filling in of worked out areas. There was a tendency upon these fields to lock the stable when the horse had bolted, and it was only quite recently that filling in had been done to any extent. He deprecated the use of slimes for filling on the ground of possible spontaneous combustion, and went on to advocate over-hand stoping in mines which dipped at an angle of 50 degrees. Dealing with explosives, Mr. Archbold said they should endeavour to protect the workmen against their own carelessness. One suggestion he made was that the gelatine boxes should be given a sharp roof like a dog kennel, so that the natives could not sit on them and smoke or stick candles on them. He attributed accidents from partially fired holes and misfired holes largely to the condition of the detonators, which deteriorated through being exposed too long to the damp air of the mines. This had been proved by experiments in America, and Mr. Archbold suggested that to avoid this the detonators should be packed in smaller numbers for issue to the miners. He had suggested as a certain measure of safety that the charge should be reversed, but this had been demurred at because it required a more expensive type of fuse, which would not burn the gelatine in passing. He thought, however, that this should not be an obstacle where human life was concerned. In the case of shaft ladder ways where the dip was between 35 and 40 degrees, the lecturer thought that partial bratticing would be useful in preventing accidents from falling stones.

Strong character, determination and tact were the leading characteristics required by mining officials of all grades. There was very little fault to find with the managers, but he was not prepared to say the same of the overseers and shiftbosses. Discipline among the men was lax sometimes except when the overseers had notice that the Inspector of Mines was coming along. The shiftbosses were very important officials in preventing accidents, and if all defects in mines were faithfully reported by the shiftbosses accidents due to negligence would be very considerably diminished. The shiftbosses should be a little better educated than the ordinary workmen, and they should be trained up on the mines and interest taken in them by those who might one day require their services in an administrative capacity. When the staffs of mines were constant, the low accident rate stood out in sharp contrast. On the West Rand Central—a small mine certainly—there had not been a fatal accident for nine years because the staff stuck to their jobs. The manner in which managers changed mines was remarkable. The contract system, proceeded Mr. Archbold, was a sweating system, different from the ordinary understanding of the word only in the sense that the men were encouraged to sweat for the large cheques which their admittedly expensive habits required. Work was scamped, and the best miners were placed in the easiest stopes, while the indifferent miners were put in the difficult places. The system killed ambition, because the good miner would not take a more responsible position for less money. Were the contract system to be abolished, he would suggest a rising scale of pay, and no man should be engaged or re-engaged except upon the lowest grade of pay. In regard to carelessness, inexperience and negligence, he pointed to the prosecutions in the Courts and the disciplinary steps taken by managers. The Safety First Committee had been started, and it was doing excellent work. Shiftbosses and overseers did not carry out the regulations as strictly as they should, and in his opinion the responsibility of the guiltily negligent persons should be smartly brought home to them. Real miners were getting scarcer and scarcer every day, and they were raising a class of man who had learned everything from sitting in the stope and watching the natives work. If a man failed as a grocer, a barber or painter, he went underground, hating it all the time, because he was pulled by an empty stomach. He seriously commended the mine training school at Wolhuter to those who intended to make their sons miners. Unless the class of miners—indeed all classes of workmen—strove to make themselves efficient, he would find that the native would be a keen competitor. There was an utter lack of co-operation among white employes to prevent accident.

SOME NOTABLE COMMERCIAL EXHIBITS.

Representative Selection of Locally Made and Imported Mining Supplies.

NOT the least interesting section of the Mining Exhibition is that devoted to the specimens of mining supplies shown by various commercial firms. Of these some of the most noteworthy are:—

The Union Steel Corporation (of S.A.), Ltd., Vereeniging, Transvaal, are manufacturers of iron and steel bars in very large variety, and some rails, tube-mill liners and grizzly bars to the sections in common use on the Rand. The works, which are situated on the Vaal River at Vereeniging, consist of the most modern and costly plant obtainable in the way of rolling and reheating furnaces, rolling mills, [illegible] power, and all the necessary equipment of a thoroughly up-to-date iron and steel works.

South African Dissolved Acetylene, Ltd. On this stand may be seen a demonstration of oxy-acetylene welding and cutting with dissolved acetylene, which is acetylene compressed into steel cylinders filled with a porous substance [illegible] Acetylene can only be compressed to a state of absolute safety, [illegible] of the gas produced by the D.A. system [illegible] and is guaranteed to be [illegible] per cent. of the original strength of the material welded. [illegible] These [illegible] of the compressed gas ensures a steady, brilliant white light.

Selcraigs (Colonial), Ltd. This firm is exhibiting one complete set of sample bottles of "Suspensol" Brand Graphite Lubricating Oils and Greases. One sample. One sample Heintz "Original and Only Genuine" Steam Trap No. 3. One sample of "Phenix" Oil Separators No. 2, 5in. diameter. One set of samples of Welsh's Patent Electric Tramways Trolley Wheel and Mechanical Ears. One set samples of "Scandinavia" M.C.M. All-woven Cotton Belting, with various belt fasteners.

South African General Electric Co., Ltd. This firm is showing an improved Flow Meter for Steam, Air or Water. The instrument is of the indicating, recording and integrating type, and is connected to the main pipe by means of a nozzle plug which makes it unnecessary to dismantle any parts of the main. Special care has been taken in the design of these meters to adapt them to severe operating conditions. There are no delicate working parts or adjustments to get out of order, and the meters will, therefore, retain their initial calibration indefinitely. The "Vortex" Turbo Pump exhibited is remarkable for its solid construction, and the pipe sections are worthy of close inspection.

Messrs. Bartle & Co., Ltd. A large and varied stand, comprising: [illegible] Patent Truck Bearing, Thomas' Patent Truck Bearing, Simon's Patent Jockey and Feed Nut Drilling Machine for assay office, Daley's Patent Safety Skip Catch, Phillips' Patent Safety Warning Device to prevent over-winding, Lemberg Safety Device, Thomas' Patent Skip Loading Device, Bartle's Air Saving Spindle, Russell's Patent Device for correcting pulley centre to cam shaft, every kind of labour saving tool, Pooley's Weighbridges and Scales, in fact everything that is required for the equipment and upkeep of a mine.

MINE SAFETY RULES SELECTED, CLASSIFIED, AND CONDENSED

A Collection from Various Sets of Regulations Prepared for the Guidance of Miners.

The following is a collection of roughly classified rules selected and condensed from various sets of regulations used by American mining companies, for the guidance of their employees. It is presented here for the benefit of any mine managers who may wish to formulate regulations for their own use. It was found to be impossible to standardize the various sets of safety rules in use at mines in other parts of the world.

RULES RELATIVE TO UNDERGROUND MINING.

Timbering.—Timber must not be hoisted or lowered through a shaft, compartment, or raise that contains a ladder. In drifts and openings timbering shall follow as close to the breast as is practicable; in soft ground sets must be placed as soon as there is room, and the roof must be secured by poles resting on the cap and set into holes at the top of the breast, these poles to remain as lagging; loose dirt on back and sides must be carefully trimmed. When timbering is done on a stope or a raise special care must be given to platforms and staging; stage poles shall be put about 2½ feet apart when raising. No spikes or nails shall project from timbers or boards placed where the nails may be stepped on or may tear flesh.

Tramming.—When power isused for tramming, no persons other than motormen and brakemen shall be allowed to ride on underground tramcars. Underground locomotives shall carry red lights and shall be equipped with automatic gongs to ring when trains are in motion. Underground trolley wires shall be guarded at chutes, drifts, and shaft openings and may be protected, where considered advisable, by inverted troughs made of boards. When several motors tram to the same shaft a block system of red and green lights shall be provided to inform each motorman whether his track is clear. Drifts and cross-cuts must not be obstructed for a longer time than is absolutely necessary.

Shafts, Skips, Cages and Ropes.—All shafts shall be inspected at least once a week; all ore and dirt shall be removed from sets and dividers, and lagging, timbers, and guides shall be examined for defects. Automatic gates shall be placed at the collars of all shafts and at all underground shaft openings and the edges shall be so protected that dirt or ore may not fall; in permanent ladder ways in shafts, collars shall not be more than — feet apart (this distance is generally specified as 20 feet or more) and the top collar must be so protected, either by toe boards or by self-closing doors, that nothing can be kicked or pushed into it. There shall be no accumulation of dirt or ore on collars or landings. Ladder rungs must be of iron and ladders shall be maintained in good condition; ladders must extend at least 4 feet above landings and shall be tightly separated from skip road, and, if in a timber shaft, shall be tightly boarded from the timber way. Riding on skips must not be permitted except in emergency, or for the purpose of examination of shaft, in which case the engineer must be notified. Man cages must be equipped with some approved safety-catch that will operate in case of rope breaking; such devices must be examined at frequent regular intervals, and must be tested periodically; records of such tests must be kept. Man cages shall be inclosed and roofed and no tools shall be carried when men are being handled therein. When men are being raised or lowered in the cage two operators shall be at the hoisting engine, the cage must come to a stop before men get on or off; hoisting ropes must be inspected at certain regular intervals, and records must be kept of such inspections.

Miscellaneous.—Abandoned drifts must be boarded up if bad air or gases are liable to accumulate therein. Lighted candles must not be placed on timbers, nor must timbers be used as candlesticks; candles must not be stored near any material that can burn. Chutes and raises must be protected that no one can step into them. Wherever possible electric wiring must be guarded. All abandoned shafts or pits must be blasted in or covered securely. A shift boss shall see that all other men have preceded him above ground at the close of shifts. On haulage roads there shall be places of refuge not more than — feet apart (this distance is generally specified as 100 yards, more or less).

RULES RELATIVE TO EXPLOSIVES AND BLASTINGS.

A misfired hole shall be reported to bosses, who shall look after it personally, and if a hole in open-pit work misfires, additional holes shall be drilled and blasted near by until the missed hole has itself been shot. No person shall blast a hole alone; he must have some one near him, and not more than five fuses shall be ignited by one person at one time. Not more than — days' supply of powder shall be kept underground (the quantity specified varies from no supply at all to a five days' supply). When blasting is being done at any point, men must be stationed at all openings leading to that point to give warning; in holing through there shall also be a man opposite the face. Powder and caps shall not be carried together to a face except for immediate use. Approved signs shall be placed on buildings in which explosives are stored. In charging open-pit black powder holes there shall be a shield over the powder to ward off danger from sparks. Gopher holes, the use of which is to be discouraged, must be loaded by some device that will place the charge in the immediate spot where it is wanted. There shall be well understood warning signals for open air blasts, and blasting shall not take place when men are in positions of danger; all men in the danger zone shall take refuge in shelter houses provided for the purpose, and the man operating the battery or firing machine shall see that all others in the danger zone are under shelter before he goes within and fires the blast.

Fire Protection.—At all mines men shall be appointed by the superintendent, who shall have charge of all fire-firing apparatus in case of fire. Special rules for the use of such apparatus shall be posted. Men shall be instructed in the use of fire helmets and rescue apparatus.

RULES RELATIVE TO SURFACE MINING.

Locomotives, Shovels, Cars, and Tracks.—Steam-shovel and locomotive engineers must make daily inspection of machines, reporting any defects. Running boards, steps, hand-holes, etc., must be kept in repair and free from any accumulation of ice, snow, dirt, or other material. Engineers must give warning signals before moving locomotives and must cut off from trains when men are working beneath them. No man shall be permitted to pass beneath the dipper of a steam shovel, nor shall shovels be moved without sufficient warning. No person whose duty does not require it shall be permitted on shovels or to ride on locomotives or stripping cars. Pitmen shall be permitted to remain on bank side of working shovel only when necessary, and banks must be kept trimmed of loose materials. All frogs, switches, guardrails, etc, must be blocked; switches leading to repair tracks must be blocked for main line. Warning signals must be placed where men work on, cross, or come on to tracks. Rolling stock set out on grade tracks must be chained, and derailing switches must be provided. Materials shall not be piled within 6 feet of standard-gage tracks. Where tracks pass close to buildings and at the ends of steps and footpaths leading to tracks there shall be permanent guardrails. Workmen must be careful to keep out from under loads suspended from shovel booms or cranes.

Test Pits and Gopher Holes.—All test pits shall be filled as soon as they are no longer needed; all others that are completed shall be protected by covering. Each open and active pit shall be guarded by a rail when workmen are absent therefrom. Gopher holes must be as small as possible, and all tamping must be by wooden tools. Tamping by stokes is forbidden, only steady pressure being permitted.

Miscellaneous.—Where roads or footpaths approach the edges of pits they shall be protected. No intoxicants shall be permitted underground, nor shall any men under the influence of intoxicants be allowed about the properties. Visitors shall be attended by some properly delegated individual. No woman or young persons shall be allowed to go underground under any circumstances. Employees are forbidden to take short cuts over dangerous places. Employees must give warning when about to drop material that might injure anyone below.

Rules Relative to Machinery, etc.—All overhead platforms, walks, or trestles shall be provided with toe boards, handrails, and guardrails. Stairways shall be substantial, provided with handrails, frequently inspected, and maintained in repair. Tools must be kept in repair; no mushroomed heads are allowed. There shall be no loose or broken boards overhead in structures or under foot in walks. Insurance-company specifications shall govern as to boiler regulations. Standard specifications applicable to the individual electrical power equipment and voltage are to govern as to care of wiring, switches, etc. Men shall not be hoisted or lowered in mines at greater speed than 1,000 feet per minute. So far as shop safety appliances are concerned, the rules laid down generally include the covering and guarding of all dangerous parts of machinery. Such parts include: All gears, rolls, drums, or slides on a machine; all spaces between the fixed and the moving parts of any machine, or between it and other structures, that leave sufficient working clearance for any person employed thereabout: all pulleys, clutches, belts, bands, driving chains, extending shafts, flywheels, starting balance wheels, shafting, spindles, couplings or projections, and other moving parts of machines; all counterweights, balance gears, and other suspensions: all elements on every machine that come in direct contact with the work and that cut, shear, or otherwise operate upon the work; all switchboards, and all piping carrying live steam or hot water.

DIAMOND BORING MACHINE
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New Combined Type for hand and power.
Absolute winning of cores.
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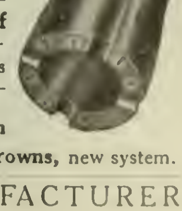
Diamond and Carbon Boring Crowns, new system.



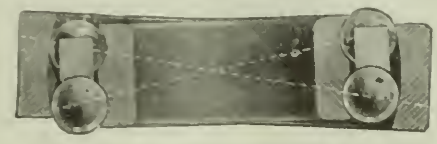
W. KRUEGEL, MANUFACTURER.
BERLIN, W. 54.

THE SKEFKO S.K.F. SELF-ALIGNING BALL-BEARING.

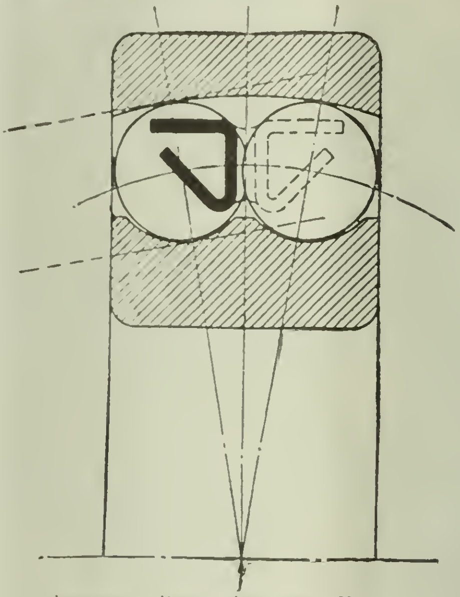
Detailed Description of a New Device of Great Promise.

[*Contributed.*]

The above is the name of a new form of swivel ball bearing suitable for adapting to all classes of mining machinery, which the Skefko (South African) Ball Bearing Co., Ltd., 23 Pritchard Street, Johannesburg, also at Capetown and Durban, have lately introduced into this country. The key-note to commercial success in any form is economy, a condition that can only be brought about in any mechanism by the control or utilization of energy for the purpose of doing useful work. Owing, however, to the necessary imperfections of our methods a large part of the energy applied is wasted in various ways, mainly in overcoming the resistances to relative motion offered by the opposing surfaces of the machines themselves. The only satisfactory means of overcoming these losses is to substitute rolling for sliding motion, that is by the adoption of ball bearings. By this it follows that ball bearings, if correctly applied to any mechanism, act as an economiser which is seldom equalled, but never excelled. The field of usefulness of the ball bearing is as wide as the domain of mechanical engineering, or at least that portion of it which is concerned with the support of rotating or oscillating parts. The ideal ball bearing should possess the following qualifications, viz.:—The steel used, both in balls and races, must meet the most rigid specifications as to uniformity, hardness, elasticity and tenacity. The balls must be accurately ground to 1-10,000th of an inch, which is no more than demanded by the more exacting applications. It is held by many that 1-10,000th of an inch is a negligible variation of size, both in diameter and sphericity of the balls, but experts are at variance with this view, and rightly so. The balls should be separated from each other to prevent contact friction at high speeds, and be free to revolve in the direction in which they travel, and capable of easy removal and replacement to facilitate inspection when required. The races must be ground to accurate dimensions, they must be continuous and free from lateral grooves, holes, or flaws of any description, and they must have such curvature as will properly retain the balls and present a uniformly rigid bearing surface. The complete bearing must be self-contained and easy to instal, capable of withstanding axial as well as radial stresses, not offer any opposition to shaft flexure, and be so designed that the load will at all times be sustained by the maximum number of balls. It is apparent that these ideal conditions are numerous and exacting, and it can be confidently asserted that until the introduction of the patent Skefko S.K.F. self-aligning double-row ball bearings, which are illustrated and described herewith, they had never been completely fulfilled by any bearing on the market. In a word it is claimed for the Skefko S.K.F. ball bearings features of superiority which must materially commend them to the consideration of all engineers and manufacturers and others interested in the economical transmission of power. A reference to the diagram, Fig. 1, will explain the patented construction of these bearings, and although at first sight it may appear deceptive, an analysis of the stresses due to the radial load will show that an equilibrium of forces exists, without any tendency to force the balls together or create unbalanced pressure on the races. The radial load on all bearings is taken at right angles to the surfaces in contact, and when these surfaces are spherical as in ball bearings it passes through the centre of the sphere. The pressure applied to the outer race is divided equally between the double row of balls, and is balanced by a corresponding pressure re-acting from the inner race. This re-acting pressure can be divided into two components, one re-acting at right angles and one parallel with the line of pressure between the ball races. As the pressures are identical from each race it follows that the whole bearing must be in perfect balance. It will be noted that the tangents of each ball at its points of contact with the races are parallel and tend to remain parallel, and that lines drawn through the contact points of the balls and the races meet at the centre of the bearing. The plane of rotation of each series of balls is therefore a cone and provides for the resistance in either direction of axial thrust. The ball cage is made in one piece without rivets or screws, and is provided with a series of pockets into which the balls are sprung by slight pressure from the side and from which they can be easily removed when required. By staggering these recesses a double row of balls are accommodated within the limits of width of the standard single row type of bearing. In support of this departure it is pointed out that the bulk of the radial load is sustained by three balls instead of the usual one only. It is, therefore, impossible to overload any one ball in the bearing. The radius of the outer race is struck from the centre of the bearing, thus allowing the balls together with their cage and the inner race to rotate as one unit within this race over a range that would instantly destroy any plain, roller or ball bearing of the rigid



Showing Ball Unit Swivelled.

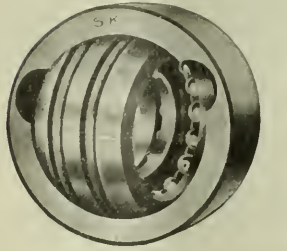


Design of Radial Bearing. Fig. 1.

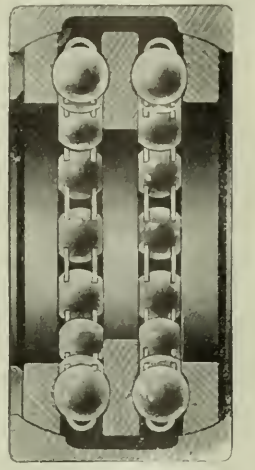
Pressed Steel Cage.

Phosphor Bronze Cage.

type. The same firm also manufactures a special patented type of self-contained double thrust bearing, which is a distinct advance on anything yet on the market. The assembly of balls and races is here such as to form a portion of a sphere, which is free to revolve inside a hardened steel casing ground internally to correspond exactly with the outside diameter of the spherically turned bearing rings. By provision of two recesses in a convenient position in the casing each and all the component parts can be instantly removed or replaced as desired. From the diagrams it will be seen that the whole forms a self-contained oil-retained bearing, which is absolutely self-aligning and is practically dust, dirt and fool proof.

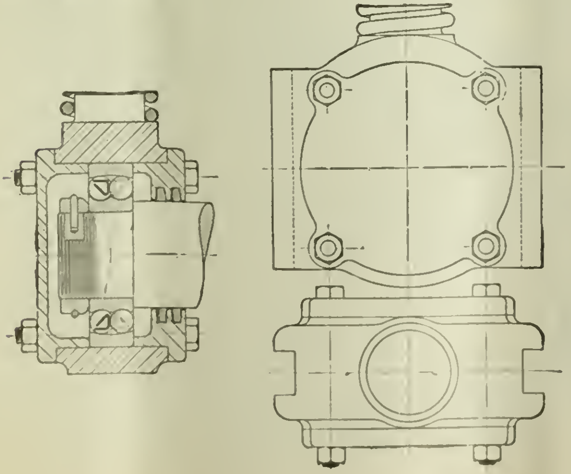


Complete Bearing.

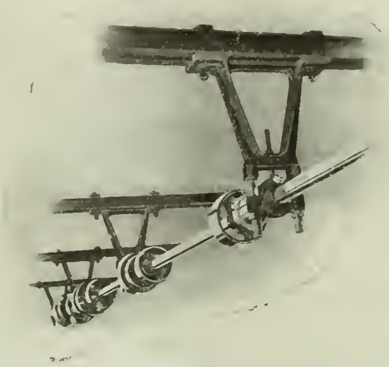


Section of Bearing.

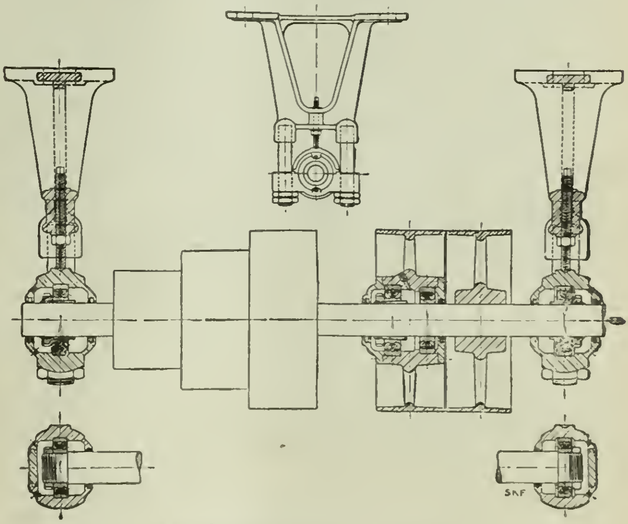
The above illustration shows a train of tip wagons used at the Municipal sand pits Gothenburg, in which ball bearings have been fitted, with the best results, making it possible to draw 10 per cent. to 20 per cent. more trucks with the same power. The sketch below shows clearly how the fitting is done.



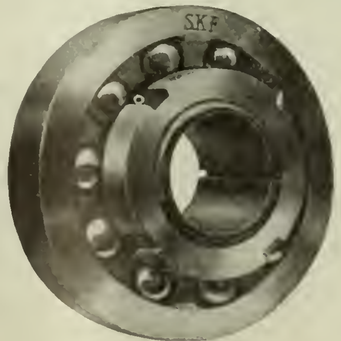
In these keenly competitive times it should be the aim of all who are responsible for manufacturing output to reduce factory leakages to an absolute minimum. One of the most frequent forms of leakage, especially in old-established workshops, is the power absorbed in driving loose pulleys and transmission shafting, which is mounted in defective or unsuitable housings. The loss of power through friction with ordinary bearings may, at a conservative estimate, be taken at from 20 per cent. to 30 per cent. of the total power applied; in fact, in many more cases than is generally believed, it amounts to 40 per cent., and even 50 per cent. With the adoption of " Skefko " S.K.F. ball bearings this loss is reduced by from 75 per cent. to 90 per



Ball Bearing Hangers.



Ball Bearing Countershaft.



Adapter Bearing.

cent. Taking the total loss of power with plain bearings at the low estimate of 18 per cent., and the saving effected by "Skefko" S.K.F. bearings at 75 per cent. of this amount, we get a saving of 13.5 per cent., or a total frictional loss of 4.5 per cent. only. The use of "Skefko" S.K.F. ball bearings reduces the lubricant bill by at least 90 per cent., and with heavy loads or high speeds this represents a considerable annual saving in cash. Ball bearings only require overhauling once or twice a year, and never by any chance run hot; consequently, the need for attention and risk of stoppage or fire from this cause is reduced to a minimum. When it is realised that 90 per cent. of the stoppages in mills and factories are due to hot bearings, this advantage must be apparent. Owing to the unique design of the bearing it is capable of resisting axle thrust. This advantage obviates the necessity of thrust collars when fitted to line shafts; one bearing being fixed in its housing (preferably the centre bearing or the one under the least load) to locate the shaft laterally and termed a "fixed bearing." The others are free to slide in their housing to take any expansion or contraction of the shaft. All adapter bearing should be fitted so that the sleeve nuts tighten up in the opposite direction to that in which the shaft is to revolve. It is essential that the bearings should be efficiently lubricated, only the best quality lubricant should be used. It is imperative that the lubricant be chemically neutral, *i.e.*, free from both acid and alkali. For high speeds it is recommended to use a thin mineral oil, but for heavy duties and low speeds grease is more suitable. The Skefko (South Africa) Ball Bearing Co., Ltd., supply a specially prepared lubricant in 2 lb. and 10 lb. tins, particulars of which can be acquired on application.

THE PRODUCTS OF THE SOUTH AFRICAN ALKALI, LTD.

Efficacy of Local Soda for Mining Uses—Interesting Exhibit at the Mining Exhibition.

THE South African Alkali Company, Ltd., has a most interesting display of various Alkali products manufactured from its natural deposit of natron, procured from the unique deposit on the farm Zoutpan, Pretoria district. In Hatch and Corstorphine's "Geology of South Africa," this pan is described as "a crater-like depression, apparently of volcanic origin, although ejectmenta, which are usually found in such occurrences are completely absent in this case." The depression is almost perfectly circular, the boundary ridge, which consists of granite, sinks steeply to the flat bottom, the vertical distance being about 269 feet. These gentlemen put down a borehole to a depth of some 200 feet below the surface of the pan, of which they gave a detailed specification, of about 27 feet, which consists of alternate layers of impregnated mud and soda. The remainder of the borehole appears to have consisted of more or less similar products. The present company commenced operations about 18 months ago, and has since then been developing and improving its methods of dealing with the natural product. It has now established a well-equipped plant for dealing with the mining and production of crude soda on the property, which plant is being constantly added to; whilst in Johannesburg it has established well-equipped works for the production of soda crystals, washing powder and also boiler fluid; these works will be extended shortly for the production of refined carbonate of soda, and at a later date it is intended to manufacture caustic soda as well. The interesting collection of exhibits includes specimens of the raw product from the pan, the crude calcined soda—both in large and granulated form—a carbonate of soda in the form of a mono hydrate, and pure refined soda ash going 99 per cent. Na_2CO_3; also a sample of boiler fluid for boiler cleansing; also a fine washing powder for domestic purposes. There is also shown a very interesting series of photographs of the pan and the surrounding hills. To all those who are interested in the industrial development of South Africa, the efforts of this company represent a distinct step forward in local industry, and the successful development of the natural wealth of the country, other than precious metals and stones. Of still more vital importance, however, is what it means to the mining industry. It is a well-known fact, to all those connected with mining matters, that one of the greatest difficulties to be encountered is that of the damage done to machinery and plant through acid water. Large quantities of lime are used on these fields for water rectification, which, whilst it has the desired effect on the water, results in the incrustation of pipes and machinery, calling for their constant cleaning and renewing. The South African Alkali Company, Ltd., is supplying, in constantly increasing quantities, crude soda for this and other mining purposes, and where such crude soda has been used the results have been uniformly satisfactory. The various other uses to which this crude soda can be applied will be apparent to all mining men; and we have no hesitation in predicting for the products of this enterprise a large and increasing field of usefulness on the Rand.

New Patents.

127. Andrew Rogers.—An improved gas meter.
128. Robert George Mahon.—An improvement in the method of bar [illegible].
129. [illegible].—Refrigerating apparatus.
130. [illegible].—Improvements in steam valves.
131. [illegible].—Improvements in process of producing [illegible].
132. [illegible].—Improvements in process of and means for producing [illegible].
133. [illegible].—Improvements in percussion drill apparatus for [illegible] boreholes.
134. [illegible] Douglas McM[illegible].—An improved air lift for conveying and raising materials in a more or less liquid state.
135. [illegible].—Improvements in and relating to rotary mills for reducing ore and other materials.
136. Ludwig [illegible].—Improvements in sanitary appliances.
137. [illegible] General Electric Co., Schenectady, New York, U.S.A.—[illegible] lamps.
138. [illegible] 39 Pretorius Street, Pretoria.—[illegible] granolithic floors, slabs and the like.
139. [illegible] Cottages, Germiston.—[illegible] shelling.
140. [illegible] Heidelberg.—Improvements in [illegible] mills.
141. Col. Sir Frederic Lewis Nathan, William Rintoul and Henry Baker, Nobel's Explosives Co., Ltd., Ardeer, Stevenston, Ayrshire, Scotland, Porny School, Eton, Windsor. Improvements relating to gelatinised propellant explosives.
142. William Charles Stephens, Climax Rock Drill and Engineering Works, Carn Brea, Cornwall, England.—Improvements in rock drilling machines.
143. George Alfred James and Electric Amalgamator Company, 28 Belden Place, San Francisco, California, U.S.A.—Method of and apparatus for recovering metals.
144. James Graham Bower, P.O. Box 668, Johannesburg. Improved levelling instrument for use in underground workings.
145. Gotthilf Ausgarius Betalande Nils Gunnar Palmgren, Villa Castor, Sodertorns Villasted, Sweden.—Improvements in or relating to automatic telephone exchange systems.
146. Henry Symes, Mornington, Dunedin, New Zealand.—An automatic recording fire alarm.
147. Samuel Hayes, 37 Jocelyn Road, Richmond, Surrey, England.—Improvements in machines for moulding from cement and other plastic material, artificial slates, tiles, sheets, slabs, or the like, for roofing and other purposes.
148. Reginald Morley and Pierson Williams, P.O. Box 668, Johannesburg.—Improvements in self discharging trucks.
149. Tabian Mercer Cox, P.O. Box 668, Johannesburg.—Improvements in concentrating apparatus of the jig type.
150. Wilhelm Mauss, P.O. Box 668, Johannesburg.—Improvements in planetary centrifugal separators.

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CONTENTS.

PAGE
Notes and News 357
Topics of the Week:
  Progress of the Barnato Mines 359
  The Consolidated Mines Selection's Subsidiaries... 359
  The Tyranny of Trade Unions 360
A European View of South African Mining 361
Mine Safety Committees for the Rand 362
Labour Efficiency on the Witwatersrand 363
Position at the Nigel 364
Mining Men and Matters 364
Manager and Staff of the Dynamite Factory, Modderfontein 365
Prospecting Permits and Claims 366
"First Aid" on the Mines of the Rand 366
The General Manager and Staff of the New Circular Shaft, Crown Mines, Ltd. 367
S.W. Transvaal Diamond Fields' April Output 368
Underground Contracts v. Day's Pay at De Beers ... 368
South African Association for the Advancement of Science 369
Dynamite Accidents and the "Safety First" Campaign 370
Notable Displays at the Mining Exhibition 371
Correspondence and Discussion: "First Aid" v. "Safety First" 372
Rhodesian Geological Survey—II. 373
Engineering Notes and News 375
  The Fencing of Machinery 375
Finance, Commerce and Industries 377
The Week in the Sharemarket 379
Company Meetings: Witwatersrand Deep; New Era Consolidated; Transvaal Coal Trust; Springs Mines; Brakpan Mines; Consolidated Langlaagte; New Primrose; Ginsberg; Van Ryn Deep; Governmen Areas; Glencairn; New Rietfontein; Witwatersrand; New Unified 381

Notes and News.

The Metal Market. Although copper, despite the unsatisfactory outlook in Mexico, maintains its price, tin continues to be a very weak factor in the metal market and the price has now fallen to a figure which compares most unfavourably with the average for the past few years. There was a decline in the price of tin in Europe on Thursday in consequence of the unsatisfactory result of the Banca sales in Holland. On the London Metal Exchange, Standard copper closed at £63 3s. 9d. per ton; Straits tin, £144 15s. per ton for cash and £146 15s. for three months' delivery.

* * * *

The Randfontein Trouble. There does not appear, at the time of going to press, to be any very definite change in the position at Randfontein, where the workmen are agitating for increased pay and certain other concessions. It may be remembered that the grievances of the men were sympathetically listened to by Mr. Ferguson, the general manager, who agreed to some of the requests and promised to give consideration to others. The meeting of underground workmen employed on the Randfontein Estates convened for last Sunday afternoon in the Robinson Hall, in connection with the trouble at Block A G.M. Co. was somewhat poorly attended, only about two hundred being present. The meeting opened with only workmen on the property being on the platform, but a resolution was at once passed inviting all members of the Executive of the Miners' Association to come on to the platform, and this invitation was accepted by Messrs. Tom Mathews, T. A. Tole, N. Toomey and W. J. Carbis. One of the speakers stated that he considered that Mr. Ferguson had only met them half way, and after considerable palaver it was decided that the deputation reiterate the demands previously made. Apparently there is not, however, unanimity of feeling amongst Randfontein employees in this matter. As we understand it, the men on the South Section are quite satisfied with conditions, and the North Section employees only are agitating.

* * * *

Consolidated Oilfields. Despite the views of Mr. Cunningham Craig, the directors of the Consolidated Oilfields of South Africa, Ltd., intend to continue to search for oil at their property at Ceres. Mr. H. Weber told the annual meeting in mail week that though the directors were disappointed at the opinion expressed by Mr. Cunningham Craig in his official report to the Government, they did not propose to abandon their attempt to find oil. The view of a gentleman of the reputation of Mr. Cunningham Craig must receive, and did receive, the greatest consideration by the directors of the company; but at the same time they had such confidence in Mr. J. E. Mills Davies, who had spent practically the whole of his life in South Africa, that they would abide by what he had to say with regard to future operations in the Ceres district.

* * * *

Oil Companies and Subsidiaries. Not the least interesting feature to be observed in connection with the oil boom which at present appears to be pervading the world, and in which our own South Africa and the adjacent island of Madagascar are playing some part, is the penchant of these oil concerns for the flotation of subsidiary companies. In one or two cases the directors of the parental corporations have laid their cards down on the table and given the public the benefit of their knowledge as to where the property in question is and what policy of exploitation they propose to adopt in regard to it. The Sakalava Company has, for instance, issued a succinct and clear prospectus setting forth the situation of the Folakara property, the allocation of capital, and the scheme of development. But in one or two other instances subsidiaries have been glibly spoken of, and for the rest, the designs of the parental concerns in regard to flotation of offshoots have been allowed to remain in mysterious and stygian darkness. Whilst it is readily conceivable that the parental organisations may have very good reasons for acquiring as much presumptive oil bearing territory as possible before disclosing their sphere of operations, we cannot see what good purpose is to be served by throwing out subtle hints of impending flotations of subsidiaries before the ground has been in some degree exploited, titles have been made secure, and the desired area acquired. Indeed, these secretive methods are likely to react on the proprietary concerns, for to talk of the flotation of subsidiaries before anything has really been established by the proprietary concern is not calculated to instil feelings of confidence in the finance methods of oil company promoters.

* * * *

What is an Outcrop?

A case involving matters in the very early days of the Rand was decided in the Rand Division of the Supreme Court on May 22nd, when judgment was given by Mr. Justice Ward in the action brought by Johann Ludwig Gaul against the Apex Mines, Ltd. Plaintiff claimed that he was entitled to an undivided half interest with the defendants in sixty claims on the farm Rietfontein, in the district of Heidelberg. There was an alternative claim for £30,000, the value of the claims. Judgment was for absolution from the instance with costs, the qualifying fees of the experts being allowed. In delivering judgment, Mr. Justice Ward touched on some important technical points. His Lordship, in the course of his finding, said:—The difference of opinion as to the meaning of the term " outcrop " was rather difficult to follow. On the one side it was sought to narrow the term to its utmost limited signification, and on the other side it was sought to extend it beyond its legitimate meaning. In his Lordship's view, an outcrop of a stratum was that portion of it which emerged to the surface and could be seen, but it surely included that portion of the Reef just below the surface of the Reef, just below the surface which could be plainly followed by going from one point of emergence to another.

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Miners' Phthisis Statistics.

Accompanying the report issued by the Government Department of Mines for April is a return of the number of applications received during the month for compensation under the Miners' Phthisis Act (19) of 1912, together with the numbers on hand at the beginning and end of the month, and the number of cases dealt with. From this it appears that the number of applications on hand at 31st March, 1914, was 806 and the number received during April, 1914, 333, making a total of 1,139. The number dealt with during April, 1914, was 359. Original awards were made in respect of 194 cases, and re-classified awards in 38 cases. In 127 cases no awards were made. The number of applications on hand at 30th April, 1914, was 780. The amount distributed in respect of original awards made during the month and additional payments on review was £41,951 2s. 5d. Number of funerals, 10; medical attendances, 7; amount paid, £191 11s. 2d.; making a total of £42,142 13s. 7d. The number of deaths of beneficiary miners notified to the Board during the month was 24. The statistics show that, classified according to age, the largest number of miners who benefited by the awards of the Board during the month were between 30 and 35 years of age. A table giving the country of origin of beneficiary miners is also appended. This shows that 25 men came from the Cape, 26 from Cornwall and Wales, 15 from Lancashire and Cumberland, 37 from the Rest of England, 18 from Scotland, 10 from Italy, and 11 from Australia and New Zealand.

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Four " Corner House " Subsidiaries.

Reports of certain subsidiaries under the control of the Corner House are now to hand for the first quarter of the current year. By far and away the most important of these is the Crown Mines, which from 514,000 tons milled earned a profit of £312,474, working costs averaging 15s. 5d. per ton. The total development amounted to 6,215 feet, and reef disclosures were: Main Reef Leader 22 inches, 84s. assay value; South Reef, 14 inches, 118s. 5d. assay value. The native labour force improved by about 15 per cent. during the three months. It is of interest to note that Mr. H. Stuart Martin has resigned his position as consulting engineer, and that Mr. R. C. Warriner has been appointed consulting engineer in addition to his position as general manager. A change, too, in the technical administration of the City Deep is to be observed, Mr. E. H. Clifford having succeeded Mr. B. Madew as consulting engineer. The City Deep's profit for the quarter from 112,000 tons milled was £75,326, working expenditure being at the rate of 24s. 8d. per ton. The development on Main Reef disclosed an assay value of 18s. 5d. and a reef width of 24 inches, and on the Leader 126s. 4d., and 19 inches. The Geldenhuis Deep milled 133,500 tons in the quarter and earned £26,711 in working profit, with costs at 24s. 3d. per ton. Development disclosures were: Main Reef 27 inches, 46s. 7d. assay value.; Main Reef Leader, 8 inches, 79s. assay value; South Reef, 16 inches, 69s. 9d. assay value. Mr. E. H. Clifford has been appointed consulting engineer of this property. At the Bantjes the development footage for the quarter shows considerable improvement, there being an increase of 863 feet. Driving on South Reef on the lowest levels at the central shaft has been re-started, and, in consequence of encouraging values obtained on the Leader, crosscuts have been started on the 9th and 11th levels to further test this reef. The disclosures on South Reef have been disappointing, but better values can be looked for as the lower South Reef drives from the central shaft advance eastwards. The native labour position improved somewhat during the quarter, but relapsed again during March; the number employed is very considerably below the requirements to admit of crushing the full tonnage and of carrying out the necessary development operations. Machines have again been extensively used for stoping purposes, there being broken 22·5 per cent. of the ore by this method in March. The tonnage milled showed an increase of 700 tons, but the profits on account of the reduced yield and only slightly reduced cost per ton are lower by £491. The profit for the three months from 67,200 tons milled was £5,677.

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Langlaagte Estate and Block B.

At the annual meeting of the Langlaagte Estate held a few weeks ago, Mr. Crosby, who presided, made a favourable reference to development in the Langlaagte Block B. mine. We understand that there has now been opened up in this section of the Langlaagte Estate property a zone of ore extending from about the 13th to the 17th levels, which is of higher grade than the average of the ore opened up and remaining in the old Estate mine. The exploitation of this zone should have a favourable influence on profits and also ore reserves. Since the end of last year, the company has been earning a profit of £13,000 per month and upwards on ore of about a guinea per ton value. An improvement on this recovery per ton would, of course, result in a substantial appreciation of profit earnings.

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New Eland Diamonds.

Some little time ago the directors of the New Eland Diamonds, Ltd.—one of the lesser productive diamond mines owned by limited liability companies operating in South Africa—decided to instal a new direct treatment plant, with tube mill and grease tables capable of handling 1,000 loads per ten hours shift, for the treatment of blue ground. At the annual meeting of the company, held in Johannesburg during the week, Mr. J. Mitchell, the chairman, announced that this plant is now working satisfactorily. The mine continues to open up well, and the directors have no reason to suppose it has in any way diminished in size at the lowest point touched, which is approximately 184 feet from the surface. It is estimated that development on this level will enable the company to obtain 270,000 loads of blue ground for the new gear, and to this must be added the ground that will be extracted from the fissure at this level, estimated at 115,000 loads. The mine is sixty miles distant from the railroad, and has thus many disadvantages to face, but it is believed by the board that dividends will be forthcoming this year, unless something unforeseen occurs. The profit earned last year was £13,293, as against £17,066 in the preceding twelve months.

TOPICS OF THE WEEK.

PROGRESS OF THE BARNATO MINES.

The feature of the Barnato meetings this week was the hearty and spontaneous tributes paid to the directors, engineers and managers by gratified shareholders. The results of the year's work on the mines of the Group have amply justified these expressions of satisfaction, and we have nothing but praise for the way in which every department of these mines has been conducted. To Mr. John Munro fell the pleasing task of reviewing in detail the operations for last year, and his speeches were models of concise informativeness. The fact that there was so little that was really new to tell the shareholders is due, of course, to the commendable policy of giving the fullest publicity to all developments on the mines of the Group. Nevertheless there are no lack of features that call for notice and emphasis. To take but a few: At the Modder Government Areas, it is noteworthy that there has been a marked improvement in development since the end of the year. The ore reserves at the end of April were 1,241,924 stoping tons, valued at 6·35 dwts. Recovery will probably work out at about 28s. per ton. The management is now hastening connection with the two southern shafts; and it is satisfactory to note that the mine can reach the producing stage without financial difficulty. At the Glencairn, costs in April, 1914, were reduced to below 12s. per ton. The pay ore reserves were only depleted by 14,000 tons during 1913. Mr. Munro at the meeting conservatively expressed a hope that the company would carry on mining operations for some years yet. In 1913 and since, the Ginsberg was hampered by labour shortage, but the profits for four months of 1914 were £17,767. At New Rietfontein the position to-day is explained in the following passage from the Chairman's speech: "Seeing that the prospecting work carried on for several years failed to discover the Rietfontein reef to the south of the dyke which cuts it off to the dip, and also that the development in the neighbourhood of No. 1 shaft had proved disappointing, it was felt that the mine could not be worked on the scale of the past few years with any hope of success. There were, however, a number of patches of payable ore available, and it was thought that detailed investigation might expose other payable patches, so it was decided to completely reorganise the working of the mine on the basis of crushing some six thousand tons of ore per month. This was done at the end of February. Two months' experience seem to indicate that the reorganisation has been successful, and it is hoped that it will be possible to run the mine on the reduced scale at a profit for some time to come." At the New Unified costs were reduced in 1913 by 3s. 8d. per ton, and there has been a further reduction since the end of the year. The New Primrose has arrived at the stage in life when fluctuations are inevitable. Costs in 1914 for four months averaged 12s. 6d. and residues were reduced. The Consolidated Langlaagte shows a gross profit improvement on 1912 by £128,394. In the first four months of 1914 working costs were further reduced by 2s. per ton. Large bodies of pay ore are being opened up in the southern section. At the Witwatersrand profits increased by £37,720. The tube mills have materially reduced the value of the residues. Development at the deep level shaft is very satisfactory. The Van Ryn Deep continues to open up good ore in both east and west sections. There is still a substantial amount of capital remaining, hence practically the whole of the net profits will be distributed for some time to come. At the meeting Col. Dalrymple expressed admiration for the rapidity and smoothness with which this mine and plant have been operated up to their full capacity. From this it will be seen that progress was the keynote of last year, and that but for the strikes and native labour shortage even better results would have been shown.

THE CONSOLIDATED MINES SELECTION'S SUBSIDIARIES.

At the annual meetings of the subsidiaries of the Consolidated Mines Selection, held this week, very lucid and satisfactory statements were placed before the shareholders. It is true that the Brakpan mine has, for reasons fully explained by Mr. Honnold, had a particularly trying year, but the setback was plainly due to a combination of causes all arising out of risks inevitable in mining. A full report of the proceedings at the annual general meetings of the subsidiaries appears elsewhere in this issue; and they will be found to give a very explicit and detailed picture of the position of the several mines of the Group to-day. The facts concerning Brakpan were set out very plainly and candidly in the annual report for 1913, issued some time back; and the interest of Mr. Honnold's speech therefore centres mainly in his account of recent developments at the property. The outstanding feature of Brakpan, of course, is that it suffered to an exceptional extent owing to its being an all-machine mine. The tonnage milled had to be reduced and, as circumstances called for an unrestrained policy in the matter of development, the proportion of the mill mixture derived from that and other low-grade sources not included in the ore reserve was so increased as to result in a yield considerably below what would otherwise have been realised. Mr. Honnold showed that during the final quarter of last year 51 per cent. of the development on reef was in profitable ore as against an average of 55 per cent. for the whole of the footage accomplished since the opening of the mine. Unfortunately, however, a reversal of tendency during the succeeding quarter resulted in only 30 per cent. of the footage on reef being of payable value. "April results," he said, "were of about the same standard, and though we are now meeting with encouragement at several important points, it has to be recognised that, so far, this year's development has been disappointing. I suggest, however, that the significance of the present showing may easily be taken too pessimistically, for the major portion of the property is still unprospected, and if one accepts the evidence of our own and neighbouring experience, he cannot but assume a recurrence of good results as development proceeds. Of course, anything may happen in mining, but, having all along interpreted the mine to you as involving the possibility of exceptional irregularity, I am not now disposed to view other than philosophically the current bad phase, even though it has been more prolonged than seemed probable." Mr. Honnold added:—

> I think I am justified in saying, however, that, with so large an ore reserve and with haulage ways so well advanced as to ensure unusual progress in the further opening of the mine, there is no reason at this stage to contemplate greater restriction of milling than that forced on us through shortage of labour. It may interest you to hear that this month's crushing promises to exceed 50,000 tons. The higher working costs of the current year call for some explanation. In so far as the work performed is concerned, there is clear evidence of improved efficiency. For instance, in the matter of stoping, the cost per square fathom, notwithstanding less favourable breaking conditions, has been reduced to 72s. 9d., as compared with 75s. 3d. last year, and 77s. 9d. the year previous. Unfortunately, this improvement, together with that in respect of other operations, is obscured by the preponderating influence of the period of bad development which has overtaken us. In such a period the expenditure on development is relatively higher than in normal times, and, of course, the proportion of labour available for stoping is reduced. Furthermore, most of the rock derived from development is, for the time being, of so unprofitable a grade as to preclude its inclusion in the mill mixture. The tonnage milled is, therefore, now reduced to a point even below the limit imposed by labour shortage, and, in such circumstances, working costs cannot but be correspondingly increased. The costs of recent months, however, cannot but be regarded as exceptionally high, since, in addition to the abnormal influences referred to, there has been extraordinary expenditure on trucks and machine drills of improved type.

Mr. Honnold added that the dividend to be declared next month would probably be at the rate of 12½ per cent. The position and immediate prospects of the Springs Mines were also very clearly explained by Mr. Honnold. At the end of last month the total development had been increased to 11,393 feet, of which 6,055 feet had been sampled, averaging 11 dwts. over 23 inches. Of the footage sampled 2,855 feet, or 47 per cent., may tentatively be classed as payable, its average assay value being 16 dwts. over 28 inches. No estimate of tonnage has yet been made, as development is not sufficiently advanced to permit of reliable calculations. It is of interest to note that recent development has shown material improvement, the average assay value in April having been 22 dwts. over 16 inches, 50 per cent. of the sampled footage being payable and averaging 32 dwts. over 20 inches. The permanent stations and station roadways have been completed and development, including the main incline and its southern extension, is being pushed forward with all possible speed. It has been considered advisable to either curtail or suspend work on the other haulage ways, as they are now well advanced and the opening of levels is of greater importance. Both shafts have been finally plumbed and the bearings of the main incline have been determined by Mr. F. G. A. Roberts, who was so successful in his survey of the connection between the shafts at Brakpan Mines. It is anticipated that the connection between the shafts will be completed in October, and it is hoped that before the available funds are exhausted sufficient development of satisfactory nature will have been accomplished to ensure the provision of further cash requirements. For the Coal Trust shareholders Mr. Honnold was able to predict the declaration of a 7½ per cent. dividend next month, despite all the troubles of the recent past. Like Brakpan, the Coal Trust suffered to an exceptional degree through the adverse influences of last year, but, as Mr. Honnold modestly put it, " the present outlook is not without encouraging features." Water shortage helped to increase the coal-winning troubles of the Coal Trust. The other chief interests of the company are in Brakpan and Springs Mines. The New Era Consolidated is in a sound financial position; and most of the concerns in which it holds shares are dividend payers. On the whole, it would seem that the subsidiaries of the Consolidated Mines Selection have emerged from a bad phase of their careers, and that the present prospects are of a reassuring nature.

THE TYRANNY OF TRADE UNIONS.

The fact that the Chamber of Mines is in favour of recognising Trade Unions if registered under the new Bill, when it becomes law, and the blessing bestowed by the Secretary for Mines on the Trade Union movement, must not be allowed to blind people to the manifold disadvantages of these organizations. That their leaders are often syndicalists at heart is, in fact, admitted by Mr. Smyth. In the second section of his annual report are given " extracts from a Report written in 1913 on the Trade Union question by one who has studied it." It is not quite clear where the extracts begin, and where Mr. Warington Smyth interposes again, but apparently the Secretary for Mines is responsible for the following comment on the prevalence of Syndicalist doctrines among the miners: " The vast majority of the troubles that arise are not due to ostensible causes, but are to be attributed to these doctrines, and to a carefully thought out policy for advancing them, and the ostensible cause of trouble is merely seized on as a convenient excuse for a move—a pawn's move or a queen's move, as the case may be in the game." Again: " The above creed represents what is believed to be the ruling motive of many Labour leaders, and of the active and militant members of their organisations, and though usually unexpressed, it is latent or nascent in the minds of all, or nearly all, of the members of the Unions. . . . The active propagandist of the extreme movement do not want questions. . . . settled in the early stages by any soothing local treatment: they want, on the other hand, in each case to create a festering sore, which will irritate the body politic into some drastic constitutional treatment, which treatment they hope to prescribe. The active propagandists of this party regard a contented workman with pity and contempt." Every day our knowledge of Trade Union methods is being extended, and it is noteworthy that employers in Germany still seem reluctant to recognise the men's organisations. But the most striking warning comes from Australia, where Union methods have again come into the limelight of late. Mr. F. A. G. Gisborne, writing in the *Empire Review*, says, *inter alia*:—

> " Space does not permit a full investigation into the causes of the progressive moral degeneracy that has characterised trade unionism in the Commonwealth within the last twenty years. The movement was originally entirely commendable. Grievances existed among the employees which could only be redressed by combined action. The early leaders of the unionists were thoroughly honest men of moderate views and marked ability. Success, however, has changed all this. Some of the men now in control of Australian labour organisations plunder their own followers, and strive to compensate them by plundering for their benefit the employers and the public. In 1910, according to reliable statistics, the wage-earners of New South Wales contributed to their unions £129,754, and received in benefits the sum of £22,829. In 1911, the corresponding figures were £163,448 and £28,743. Thus " management " expenses during the two years amounted to nearly £200,000, a sum approximately four times as large as that devoted to promoting the welfare of the members. Evidently the managers valued their services somewhat highly. They both preach and practice the gospel of grab. Their attitude alike towards the rank-and-file of the army of trade unionism, and the whole body of independent, unorganised labour is one of tyranny and persecution. In some cases an industrial Reign of Terror has become established. The slightest breach of the rules promulgated by a small band of irresponsible oligarchs is punished with draconic severity. Revolutionary movements, whether religious, social or political, invariably reach this phase sooner or later, and it is a sign of the approaching end. The superheated contents of the cauldron boil over, and finally extinguish the flames beneath. Resentment is provoked both within and without. The internal enemy is always more to be dreaded than the external. The evils, both political and industrial, that have attended the growth of the trade unions in the Commonwealth are the results of several contributory causes."

This is bad enough; but more powerful testimony still comes from America, in the form of a sweeping but reasoned denunciation of the Unions—quoted recently in these columns—by Ex-President Eliot of Harvard University, who wrote:—

> " My objections to the trade unions are altogether educational and moral. They seem to me to have had a bad effect on the character and happiness of their members because of certain methods which they have used and are still using. The first of these objectionable methods is the habitual use of violence against persons and property to gain their ends. The second is the limited output. The third is the uniform wage, alike for all journeymen without regard to age or skill. The fourth is the disregard of contracts—their own contracts and the contracts which employers or managers have entered into with owners or consumers but have not yet fulfilled. The first and last of these practices are grave violations of the universal moral sense. The second and third rob the working man of strong motives for self-improvement and make it probable that he will do no hearty, zealons, faithful work. Under those conditions it is impossible to be happy in the life work; for there is no happy, contented work except that done with good will, generous zeal and loyalty. I cannot agree with you that the trades unions have brought happiness to any working man. Higher wages, shortened hours, better clothes and more meat do not necessarily contribute to genuine happiness, any more than the luxuries of the rich do. Happiness and content are states of mind. Is it not perfectly plain that in our country the trade unionists are not really happy as a matter of fact? To my thinking they never will be, so long as they get no satisfaction in their daily work. It is the grudging spirit in which they work which prevents them from getting any content out of their work for a livelihood. All well read, thinking people believe that the progress of civilisation depends on universal, steady, productive labour; the unions seem to believe that the less one works the better."

It is noteworthy that the question arose at a dinner of the Massachusetts Reform Club, on February 20th, when Dr. Eliot declared that " labour unionism is the most formidable danger in our future." " It is a moral danger," he continued, " as well as material. The unions just rot a man's character and no one can escape their influence. The tendency is to work day after day with the deliberate purpose of doing as little labour as possible in the least number of working hours. Our Government is afraid to tackle this monopoly. We find our political leaders submitting more and more to organised labour. The present railroad situation is a straight consequence. The Trade Union spirit on the railroads is destroying essential discipline and earning power. We can hope for no remedy of this evil from either the national or state governments. Politicians are becoming more and more afraid of organised labour, despite the fact that there are only about 2,000,000 votes out of that class in the total of 17,000,000 voting strength of this country." A similar opinion has been expressed by that distinguished economist, the Right Hon. Charles Booth; and evidence to the same effect could easily be multiplied. The moral is, of course, that though the recognition of the Trade Unions in this country may mean the end of some of our Labour troubles it may, on the other hand, mark the beginning of others.

A EUROPEAN VIEW OF SOUTH AFRICAN MINING.

Interesting Interview with Mr. R. J. Frecheville—Messina and Its Future— Authoritative Views on the Copper Market—Rand Stocks Out of Favour.

There is at present visiting Johannesburg one of the best known mining engineers of the United Kingdom, in the person of Mr. R. J. Frecheville. Mr. Frecheville is a Director of the Consolidated Mines Selection Company, the Messina (Transvaal) Development Company, the Lena Goldfields (Siberia), and other important mining enterprises in Mexico and the United States. This is not the first occasion upon which he has visited South Africa, as between 1892-96 he was a resident of Johannesburg and about six years ago he examined the properties of the Tanganyika Concessions Company, in the Belgian Congo, and afterwards inspected and reported on the Messina mine. Whilst Mr. Frecheville, by virtue of his position as Director of the Consolidated Mines Selection, is interested in the Brakpan and Springs Mines and other Rand enterprises, it is understood that his visit to Johannesburg at the present time is concerned with the Messina Mine only. Mr. Frecheville represents a type of man whose presence on the board of a mining company is of real and lasting value, as he occupies a high position in the field of mining technology and can bring to bear on any problems that may demand consideration a long and varied experience gained in mineral fields in many parts of the world. We felt therefore that Mr. Frecheville's views on South African miniug matters would be of very material interest to readers of this paper, and accordingly we approached him during the week and asked for an interview. Mr. Frecheville assented to submit to the ordeal.

Messina: Favourable Prospects for Deep Working.

First of all we asked a few questions in regard to the Messina Mine.

"Messina is opening up very well," Mr. Frecheville replied. "It is not, of course, an enormous property, like some of the cupriferous deposits of North America. But Messina is a rich mine, and moreover everything warrants the view that the rich deposits of chalcocite and bornite will continue down to a very considerable depth. An American geological expert has recently demonstrated the fact that the chalcocite and bornite veins of Butte contain primary minerals, that is to say, these high-grade shoots of ore are not the result of secondary enrichment, which generally means a limited concentration of values in depth. At Butte these rich shoots have been worked down to a vertical depth of over 3,000 feet, and I believe that at Messina our high grade ores of chalcocite and bornite are primary deposits and that they will be found to continue to a much greater depth than the present lowest level of the mine. We are now down to the tenth level at Messina—1,000 feet from surface—and we are arranging to sink both shafts down below this level. Our new winding engine is designed to hoist from 2,000 feet, and when we reach this depth I feel sure we shall have to purchase a larger and still more powerful hoist to haul ore from deeper levels."

"You intend proceeding with the lateral development of the mine at the same time?" we next queried.

"Of course," replied Mr. Frecheville. "But you must remember that in the vicinity of the twin shafts we have the wonderfully rich 'Bonanza' lode, which represents, so to speak, the concentrated essence of the mine, and we are naturally therefore at the present mainly concerned with prosecuting the development of this valuable central section of the property in depth."

A Tribute to the Management and Employees.

Mr. Frecheville then went on to speak of the greatly improved transport facilities now obtaining at the mine and recalled the time occupied in reaching the property on the occasion of his previous visit six years ago. He also paid a well-merited tribute to the management of the property on this side.

"Mr. Calderwood," he said, "has done wonderfully good work. He has built Messina up unit by unit until it has become the highly prosperous industry that it is to-day. His estimates have always come out on the right side, and that is not always the case with mining engineers," he remarked with a little smile.

"Mr. Calderwood," he continued, "has been most ably supported by Mr. Woodburn, the manager at the mine, and furthermore they are both to be congratulated in their selection of staff and employees. Indeed, I was most impressed by the spirit of good fellowship that prevails at the mine. In an isolated mining camp such as Messina is, one generally finds the employees split up into quarrelsome cliques and factions, but that is by no means the case up on the Limpopo."

The Smelting Question.

"What smelting policy do you propose to adopt at Messina?" we asked.

"Well, the results we have so far achieved have been eminently satisfactory. Of course, the furnaces have been small, and we are now considering what course we shall take in the future. We have engaged the services of Mr. W. G. Perkins, a gentleman who has specialised in the metallurgy of copper and who has had a very varied experience in America, Russia, and elsewhere. Mr. Perkins will investigate at the mine and advise us accordingly. At the present it is indefinite whether we shall extend our smelting operations or concentrate all products to a maximum of richness and ship the whole output as concentrates. It all depends which course means the largest profit for the company, and that can only be decided by a careful study of the whole question of treatment and smelting in relation to freights and other matters."

South Africa and the Copper Trade.

"Do you not think that in the years to come this country will develop its own internal copper trade?" we ventured.

"I should say that is most likely," retorted Mr. Frecheville; "but the day is probably a good long way off when we should be justified in erecting mills for the turning out of finished products, such as copper plates and wire, in South Africa. It all depends on the value of the local market and the cost of production. Of course, the Government might in the years to come consider the question of fostering a local market by means of a protection tariff. The Russian Government has taken such a step and a duty of £30 per ton is imposed on all copper imported into the Russian Empire."

"What are your views regarding the future of the copper market, Mr. Frecheville?"

"Well, at present the consumption seems to keep a little ahead of the supply. It is not easy to prophecy, but I think the price of copper is not likely to drop much below present quotations for a good many years to come. Yes, there are new mines opening up. There are the Chilian deposits owned by the Guggenheims, and the Katanga properties are turning out an increasing amount of ore. Very likely a satisfactory metallurgical process for the treatment of the siliceous ores of Katanga may be devised. At any rate, I quite believe that human ingenuity will devise such a process, but it has yet to be demonstrated. On the whole I do not think that the production of copper will exceed the demand—not in the near future, at any rate—and as no satisfactory substitute for copper appears to have been found I believe the price will be at least maintained."

The Rand and Oversea Capital.

"What are your impressions in regard to the Rand?" we asked. "Do you think the tide of oversea capital is likely to flow to these fields again in the future?"

On this point Mr. Frecheville was by no means encouraging.

"So far as I can judge," he said, "the majority of the mines here are in very sound positions. I could mention a considerable number of properties which I think are at to-day's prices, excellent speculative investments. But I fear that it will be a long time before South Africa becomes a popular field for mining investments again. It is unfortunately true that in the past the European public has lost appalling sums of money in South Africa. The effect of that is very evident to-day. At the present time financial men in London are prepared to discuss and consider projects in Nicaragua, in Siberia, in fact in nearly every part of the world, except South Africa. When you mention South Africa they suddenly remember they have important appointments to keep."

"You think, then, Mr. Frecheville, that if the blocks of Government mining ground on the Further East Rand are to be opened up more favourable terms for leasing them than have so far been offered will have to be made?" we asked.

"Undoubtedly," said Mr. Frecheville, "much more favourable."

This brought an interesting conversation to an end, and thanking the oversea Engineer-Director for his views we took our departure.

MINE SAFETY COMMITTEES FOR THE RAND?

Uses and Functions of Committees—Examples from Other Fields.

Whether Safety Committees should be formed on the mines of the Rand has been seriously considered by the promoters of the "Safety First" movement, and some illustrations of their value elsewhere may profitably be cited. Various American mining companies have organized Safety Committees to plan and carry forward measures looking to mine accident prevention. The Oliver Iron Mining Co. and the Cleveland-Cliffs Iron Co. are notable examples. These two companies are specifically mentioned because they have expended more money and have carried their safety measures to a greater elaboration than have any other mining concerns in the region, although they may not have given more thought to the problems than would be natural from the wide extent of their mining operations. The Oliver Iron Mining Co. is by far the largest employer of labour in the Lake Superior iron districts, and one would naturally expect that its work would be conducted with a precision based on a wealth of detailed information, and with a broader view and a greater expenditure than could be the case with some smaller operator. And this is the fact: the company's expenditures for safety are greater, per ton of production, than those of any other iron-mining concern aside from the Cleveland-Cliffs Iron Co. The cost per ton of iron ore produced has been increased by the introduction of safety precautions, though it is believed that the saving in personal-injury payments under the voluntary-relief plan will bring about such a reduction in costs as will warrant the expenditures that have been made, aside from any humanitarian consideration. After the installation of devices has been made it is found that their cost of maintenance per ton of ore mined is almost negligible.

Mine Safety Organization of Oliver Iron Mining Co.

The general safety committee of the Oliver Iron Mining Co. consists of seven members, whose chairman is the general superintendent of one of the Mesabi districts. The general safety committee has headquarters at Duluth, Minn., and its seven members are drawn from the various districts in which the company's mines are situated. After careful study of the causes of accidents, the study being based on reports from mine superintendents and others, it formulates such rules as will tend to prevent accidents and remove their causes. These rules are changed from time to time, as experience may dictate. All the work of this committee is passed on and approved or rejected by the general officers of the company, at Duluth. Enforcement of the rules adopted is imposed on the general superintendents of the various districts. The company's mine inspectors travel constantly from one district to another to note conditions, to observe whether rules are observed, and to make suggestions as to changes. The four subordinate district committees report monthly to the several general superintendents as to the progress of all safety-appliance work and carefully note any violations of approved rules. They investigate the causes of accidents and offer suggestions as to means of prevention. Finally, all employees are educated to the need of care and watchfulness.

Functions of Mine-Safety Committees.

The committees act on all matters relating to increasing safety at mines, such as the desirability of any proposed safety devices and appliances. They appoint special committees to visit the various properties, and to make inspections, reports, and recommendations. They give careful consideration to reports of serious accidents with a view to the prevention of their recurrence. They assist in the relief plans that are formulated by the companies with which they are connected. Some companies, which control mines, ships, docks, furnaces, and steelworks, have a general supervisor of safety, who takes the place of a chairman and is expected to spend his time in the consideration of safety precautions, and to visit each of the plants at intervals. For the make-up of committees men from various branches of work are selected; thus mining captains, underground operatives, and mechanics are apt to make visits together and see all details of the works and of the mines. Committees are shifted from time to time, so that new ideas may be brought to bear on the situation. One company has special committees for each branch of its work. One committee gives its attention to safety matters underground, another to open-pit work, a third to standard warning signs, etc., still another to moving machinery, and so on. Rules have been framed pertaining to underground work, timbering, care of ground, handling of explosives, open-pit operations, machine shops, boilers, railway tracks and appliances, and stationary and traction engines, and reports as to how these rules are enforced and observed, and as to their efficacy, are made to the managements at regular intervals. Mine superintendents are held strictly accountable for conformity with these regulations and for a general regard for safety, whether under special rules or not. Foremen are made to see that their efficiency is gauged, not only by the amount of material they move and the cost thereof, but especially by how few serious accidents happen to miners. Thus co-operation is assured on the part of all in positions of immediate authority over the men actually engaged in mining, and foremen are on the lookout for infractions of both the spirit and the letter of the rules. Men understand that failure to cordially support safety regulations may mean discharge. An increasingly large number of companies spares no reasonable expense in order to protect machinery in shops and mines and to reach a point where mechanical operations shall be as free as possible from unnecessary risks.

LABOUR EFFICIENCY ON THE WITWATERSRAND.

The Industry's Great Need—Has the Productive Value of the Worker Increased?—Rand Miners and Craftsmanship—Is Efficiency Improving?

Industrial analysis is always interesting, and if many columns of calculations elicit only one new vital fact or figure the calculations are certainly worth while making. No aspect of mining on the Witwatersrand claims so much attention at the present moment as that of labour efficiency, for it is felt, and rightly, that on the ability of the Rand's workers to raise the tonnage milled the future prosperity of the Reef largely depends. Of course, any remark on this subject is at once assumed by ill-informed critics to mean the reduction of wages. Some people, it seems, are unable to see that higher efficiency and lower wages are two quite different things.

Efficiency Engineers.

How great a part efficiency plays in our industrial life has not perhaps, for all that has been written on the subject, been adequately realised in this country as yet. In America the subject has been pursued so far that efficiency engineers have been appointed to highly responsible positions in many of the larger industries, and their duties are accounted of supreme importance in the administration of large works, mines and manufacturing projects. Here on the Witwatersrand the problem of how to increase efficiency is a much more difficult one than it is in America, or, for that matter, probably anywhere else in the world on account of the peculiar disadvantages under which these fields labour. In the first place the fact that instead of practically one class of labourer as in America, workers on the Rand are broadly divided into two classes—skilled and unskilled (the skilled being generally taken to mean the white, and the unskilled the coloured labourers)—must be recognised. This segregation is in itself a cause of labour inefficiency, insomuch as it gives an undue advantage to one class and imposes an unfair disability on the other class.

Views of Leading Mining Men.

The most obvious way to improve this efficiency would be to engage the two branches of labour in open competition, one against the other. On this point a leading mining engineer, who is most desirous that the white races should maintain their supremacy, made the following interesting remarks to a representative of this paper the other day:—

"No one is more anxious than I am to see the whites maintain their lead in the battle of the races. I have great faith in the white race, and I am confident that we shall maintain our lead in every walk of life. At the same time I would like to see more competition between white and coloured workers on these fields. I am sure that this would result in great benefit to the whole community, for it would act as a stimulant to the white miner and would urge him on to do very much better work than he does to-day."

Another engineer expressed the opinion that all love of craftsmanship had passed out of the white miner on the Witwatersrand. "Years ago," so this gentleman stated, "the greater proportion of men working on these fields were skilled and experienced miners who had gained their knowledge in other countries and who brought to the Rand a most valuable fund of experience. To-day the position is vastly different. The majority of the Rand's so-called skilled labourers take no interest in their work whatsoever. Most of them regard mining as a mere stop-gap, and if such a feeling pervades the vast army of the Rand's workers it is not difficult to understand why efficiency along the Reef is much below a standard that might reasonably be desired."

An Interesting Opinion.

In a very interesting and thoughtful letter contributed to this journal by Mr. E. J. Moynihan last week, some important aspects of labour economics are touched upon. Mr Moynihan combats the idea that more free competition between white and black miners would result in the reduction of working costs, but the majority of mining men who have given the subject much consideration are not in agreement with him there, as they believe that the white man in this country only requires a really strong incentive to achieve better work, and the efficiency of our white miners will show very substantial improvement. Where Mr. Moynihan's contribution holds out the greatest amount of interest and hope for the Rand is, however, where he discusses working costs in the mines of Alaska. Even after making all due and necessary allowances for the advantages that exist in the cost of the Juneau mines, such as in regard to great width of mineral bearing deposit, it would seem that the low costs obtaining in sub-arctic America may yet be in some degree imitated on the conglomerate fields of the Transvaal, provided that labouring efficiency can be bettered. There need be no talk of decreasing wages if the output of ore per man employed can be made greater.

Man and the Tons Milled.

A few figures relative to the productive capacities of Rand workers in two different periods may here be of interest. At the same time, it should be stated that calculations based on the factor of tons milled per man must not be regarded as infallible or closely accurate representations of labour values. In the year 1911 the number of tons milled per labourer employed on the producing mines of the Rand in each month was 9·7, whereas last month the figure was 11·3 tons. Taking the figures on the basis of tonnage per white man employed only, the improvement between these two periods has been from 86 to 102 tons per month per capita. On the basis of coloured persons only there has been an advance from about 11 to 13 tons per month for each coloured person at work on the productive mines of the Rand.

Has Efficiency Improved?

These figures would certainly seem to give the lie direct to the statement that the miner of to-day has lost his sense of craftsmanship and is not on the average such a good workman as he was a few years ago. The figures promise an interesting controversy and certainly seem to show that there is a good deal in the arguments of those who believe that, man for man, the Rand mine worker of to-day is at least as efficient as the worker of 1911 and previous years when the output per capita was less than in 1911. But to our mind the deductive value of these statistics is largely negatived by the fact that in them no allowance is made for the many mechanical improvements that have been introduced into Witwatersrand mines during recent years. Neither do they accurately reflect the direct beneficial influence of better health conditions. Clearly these are most important factors to be borne in mind when considering the figures given above and their relation to pure manual efficiency. But whether efficiency has improved or whether it has not improved does not affect the point that there is still abundant room for advance in this direction. A ton of Rand ore does not on the average yield nearly so much as it did a few years ago, and if the vast low-grade reserves of the Main Reef series are to be turned to profitable account the productive value of a workman will have to improve or the difference between expenditure and revenue will have to be made more attractive in another direction. Hence it is in the interest of the whole State that some strong and concerted effort should be made amongst employees to raise the standard of workmanship. The white miner of the future will have to be something more than a supervisor of "unskilled coloured labourers" if he wishes to maintain his industrial status and secure for mining on the Rand that expansion of which South Africa is at present in such dire need of.

POSITION AT THE NIGEL.

Serious Shortage of Water—Will the Mill Close Down?—Encouraging Developments in Rand Nigel Section.

THERE are substantial grounds for fearing that the battery at the Nigel gold mine will have to be temporarily hung up in the very near future. The trouble is lack of water. For several months past a very serious drought has prevailed in the Nigel district. We understand that the amount of water in the Blesbokspruit is very small indeed, and so serious had the position become for the Nigel mine that in March twenty stamps had to be hung up and the tube mill stopped for some days.

A Wire from Maritzburg.

In the report for the last quarter the board makes it very clear that the position is most serious. The directors state in their official communication:—

"A very serious drought has prevailed at the Nigel for some months now which necessitated the hanging up of 20 stamps and stoppage of tube milling operations for some days during the month of March. Various expedients are being resorted to to keep the plant in operation, and it is much to the manager's credit that he has been able to keep going so long. Pumps had to be installed and long lengths of piping laid to get water from disused shafts and other places. Too much emphasis cannot be laid on the seriousness of the position, for, although slight rains have fallen the trouble is by no means over, and unless substantial rains fall before the dry season sets in it is feared the whole battery may have to be stopped till the following rainy season brings relief. No effort is being spared to supplement the present precarious supply. Amongst other resources boring for water is being employed, but although the borehole is down 200 feet the results are negative so far."

With a view to eliciting the latest information, we wired a few days ago to the head office of the Nigel G.M. Company in Pietermaritzburg, enquiring if it was true that milling operations at the mine were about to be suspended. To this the company wired in reply, "No change in conditions at mine since issue last quarterly report." We understand that the rains that have fallen during the past week have not sensibly improved the position, and the greatest anxiety is being felt in the Nigel district as to the future. Fortunately the Sub Nigel mine is much better circumstanced in regard to water supply than its neighbouring and older mine, but it must be only too clear that suspension of milling operations at the Nigel would be a most serious blow to the district, and unless the unexpected happens and the supply of water is materially augmented the least serious result that is to be anticipated is a considerable curtailment of milling operations.

Recent Returns.

The Nigel has always been a most interesting property, and by reason of the [illegible] erratic nature of the reef body and [illegible] and the isolation of the mine it has always been regarded as a mine which possesses characteristics quite different to those of the much larger properties on the Main Reef series several miles away to the northward. In the early months extraordinarily high grade ore was crushed, and as late as 1903 the recovery was 72s. 3d. per ton, of which working costs claimed the not inconsiderable proportion of 57s. 10d. Of recent years, however, the yield per ton and the profit has diminished appreciably. Thus in the first three months of the current year 38,050 tons were milled for a return of 30s. 7d. per ton. Working costs claimed 2[illegible] per ton so that the resultant profit was [illegible] per ton, or [illegible] in the aggregate. In the month of April the total profit earned was £3,031.

Development.

In the report for the quarter ended with March last the directors present much useful information in regard to development, etc., and from this we abstract the following: During the period under review native labour has been plentiful, in fact we have had more than our complement, which has contributed to increased working costs. At date, however, the number is nearer normal requirements. Although a considerable number of feet were cut during the quarter the result was disappointing, much of the ground gone through was very irregular and proved of little value. Nigel Section: No. 3 shaft: Sinking in this shaft was stopped during the quarter ended 31st December last. In the 23 level east, the lowest level in this section, No. 1 shoot was intersected in January, but the values were poor. The 22nd level is now in No. 2 shoot and development here gave payable values, the assays in January and February over 24 inches being 21·2 and 19 dwts. respectively, but in March values fell to 7·6 dwts. The 11th level east was driven 204 feet during the quarter but nothing of value was disclosed. A series of faults were encountered from time to time and now a dyke has been struck, but it is expected that this obstacle will be overcome at an early date. No. 7 shaft: Drives east and west on the 20th or lowest level were carried on and payable values were maintained throughout their lengths, which are 216 feet east and 96 feet west. No. 10 shaft: The 13th level north has gone through the shoot. The level has opened up a large area of stoping ground of good value. No. 12 shaft: The 11th level south was driven 405 feet from the shaft but has not yet reached the shoot; this, however, should be intersected at an early date. Rand Nigel Section: Development has been vigorously prosecuted in the section of the property during the quarter, 765 feet having been cut. A shaft was sunk 147 feet and C shaft 157 feet. Driving was confined to the 8th level west of A shaft where payable values were discovered; a sample the other day giving 100 dwts. over 3 inches, which appears to be the thickness of the reef in this region. A steadily increasing tonnage of millable rock is now being crushed from the Rand Nigel section, and as soon as a little more development has been done we hope to get up to 4,000 tons a month, which was the tonnage calculated on to be drawn from that section.

The Chairman's Views.

At the annual meeting of the company, held in Maritzburg on Thursday, Mr. Leonard Lane, who presided, stated that the board's anticipations with regard to profits had been realised, enabling them to clear off all liabilities to March, 1913, and to declare dividends totalling 15 per cent. Working costs had increased from 23s. 10d. to 24s. 4d. per ton, the gross revenue was 30s. 7d., as against 30s. 2d. for the previous year; and the profits 6s. 3d., as against 6s. 3d. A constantly increasing tonnage of payable ore was being drawn from the Rand Nigel property. The mine had been free from industrial troubles, and he was glad to bear witness to the loyalty of the employees during the troublous times. The shortage of water was the most serious factor, and unless a substantial supply were struck within a few weeks it would be impossible to continue operations; but everything humanly possible would be done to avoid closing down the battery.

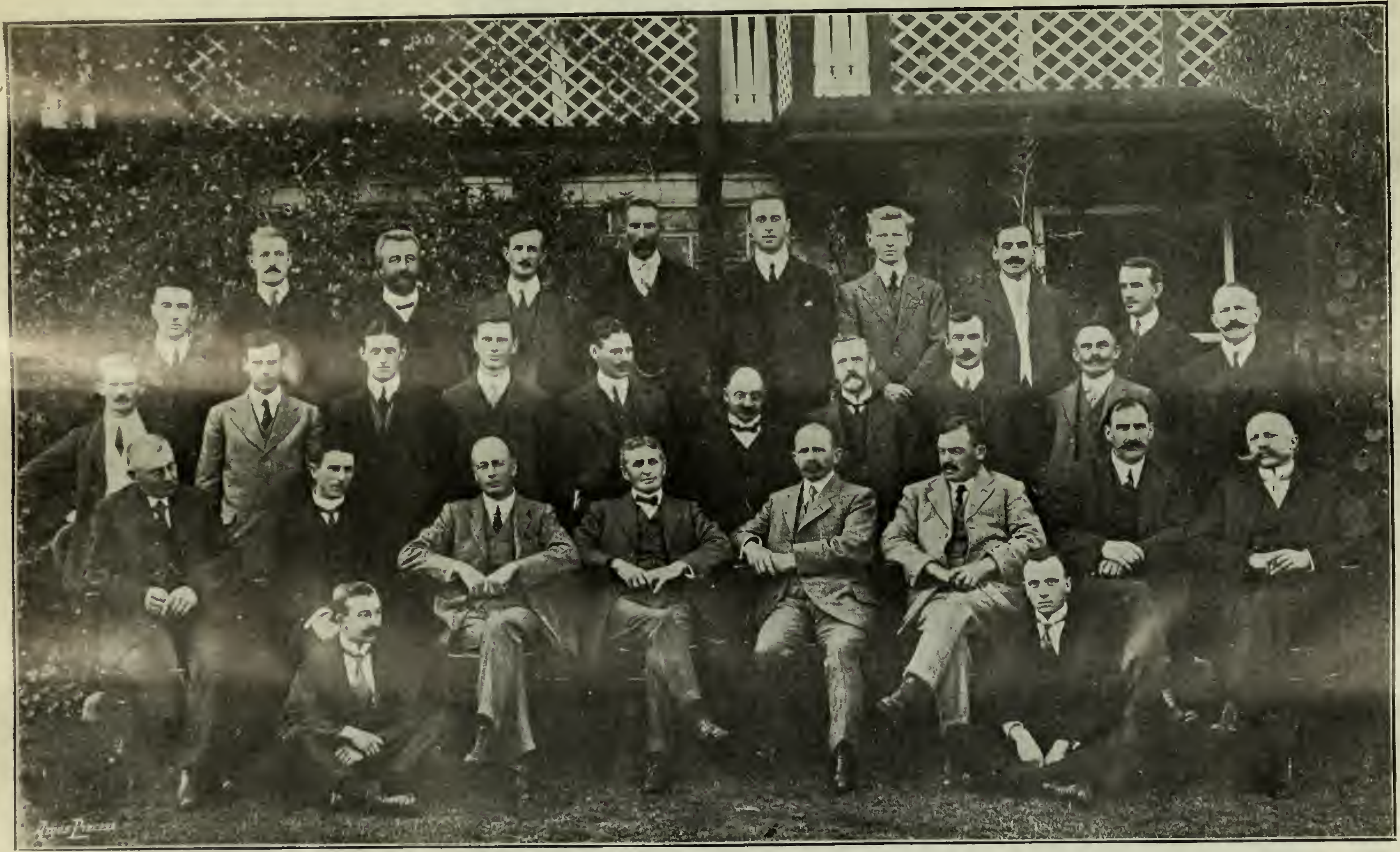
MINING MEN AND MATTERS.

Mr. J. A. P. Gibb has been appointed advisory engineer to the Anglo-French Co., Ltd., in South Africa.

* * * *

His many friends will be glad to hear that Mr. E. W. Hutt, for many years with the Johannesburg Consolidated Investment Co., Ltd., has been appointed consulting mechanical engineer to the New Kleinfontein Company.

THE MANAGER AND STAFF OF THE DYNAMITE FACTORY, MODDERFONTEIN.



Back row: J. Jardine, Clerk; W. F. Templeton, Clerk; B. P. Bendtsen, Magazine Superintendent; C. B. Aylmer, Clerk; C. Jongbloed, Transport Superintendent; H. T. Broek, Foreman, Factor 1; D. L. Allan, Chemist; D. McGregor, Clerk; A. G. Stewart, Assistant Engineer.
Second row: J. T. Pullen, Assistant Postmaster; G. Lundholm, Chemist; E. F. Watson, Clerk; J. A. Campbell, Acid Superintendent; G. F. Ayers, Laboratory Superintendent; S Bernheim, Cashier; J. Brodie, Clerk; A. M. Dorward, Compound Manager; C. Grim, Assistant Storekeeper; J. Fraser, Clerk.
First row: D. Lodder, Branch Line Superintendent; T. Halbert, Superintendent, Factory 1; L. Colquhoun, Under Manager; W. Cullen, Manager; G. Burmester, Chief Engineer; A. D. M. Grant, Medical Officer; A. Archibald, Chief Accountant; C. Bachmann, Chief Storekeeper.
Sitting: H. Fielden, Chemist; P. Greig, Draughtsman.

Olliver, Photo.

PROSPECTING PERMITS AND CLAIMS.

Lessons from Latest Statistics—Decreased Activity.

A RETURN of prospecting permits and prospecting, diggers' and base metal claims held in the Transvaal as at 30th June, 1913, 31st December, 1913, and 30th April, 1914, is attached to the statistics issued by the Department of Mines and Industries in respect of last month. From this return it is clear that there has been still further diminution in the last few months in claims held but on the other hand the number of prospecting permits in force at the end of last month shows an increase when compared with the figures as at December 31st, 1913. The claims held in the Transvaal on the dates named were as under:—

	June 30, 1913.	Dec 31, 1913.	April 30, 1914.
Prospecting ...	71,344	66,535	67,868
Diggers'	11,384	11,490	11,618
Base Metal	54,190	43,229	37,127
Total	136,918	121,254	116,613

It will be observed that the largest diminution is noticeable in regard to base metals, particularly in the Pietersburg district. In that area there were held at June 30th, 1913, 51,190. Six months later the number was 43,229, whilst at the end of April, 1914, only 37,127 were held. In the Pilgrims Rest area, however, the number of prospecting claims held shows advance from 6,864 at June 30th, 1913, to 7,102 at December 31st, 1913, and to 8,944 at the end of April. These figures are, too, reflected in the statistics relative to prospecting permits. At 30th June, 1913, the total was 527; at 31st December, 1913, 387; and at the end of April last 460. Here, again, there is evidence to prove that Pilgrims Rest is a centre of much activity for the prospecting permits in force at the end of last month were 134 as against 78 at December 31st, 1913, and 104 at June 30th, 1913. In the Barberton district a large number of claims appear to have recently been abandoned. In so far as the Witwatersrand area is concerned, figures as to "prospecting" and "diggers'" and total claims show very little fluctuation.

"FIRST AID" ON THE MINES OF THE RAND.

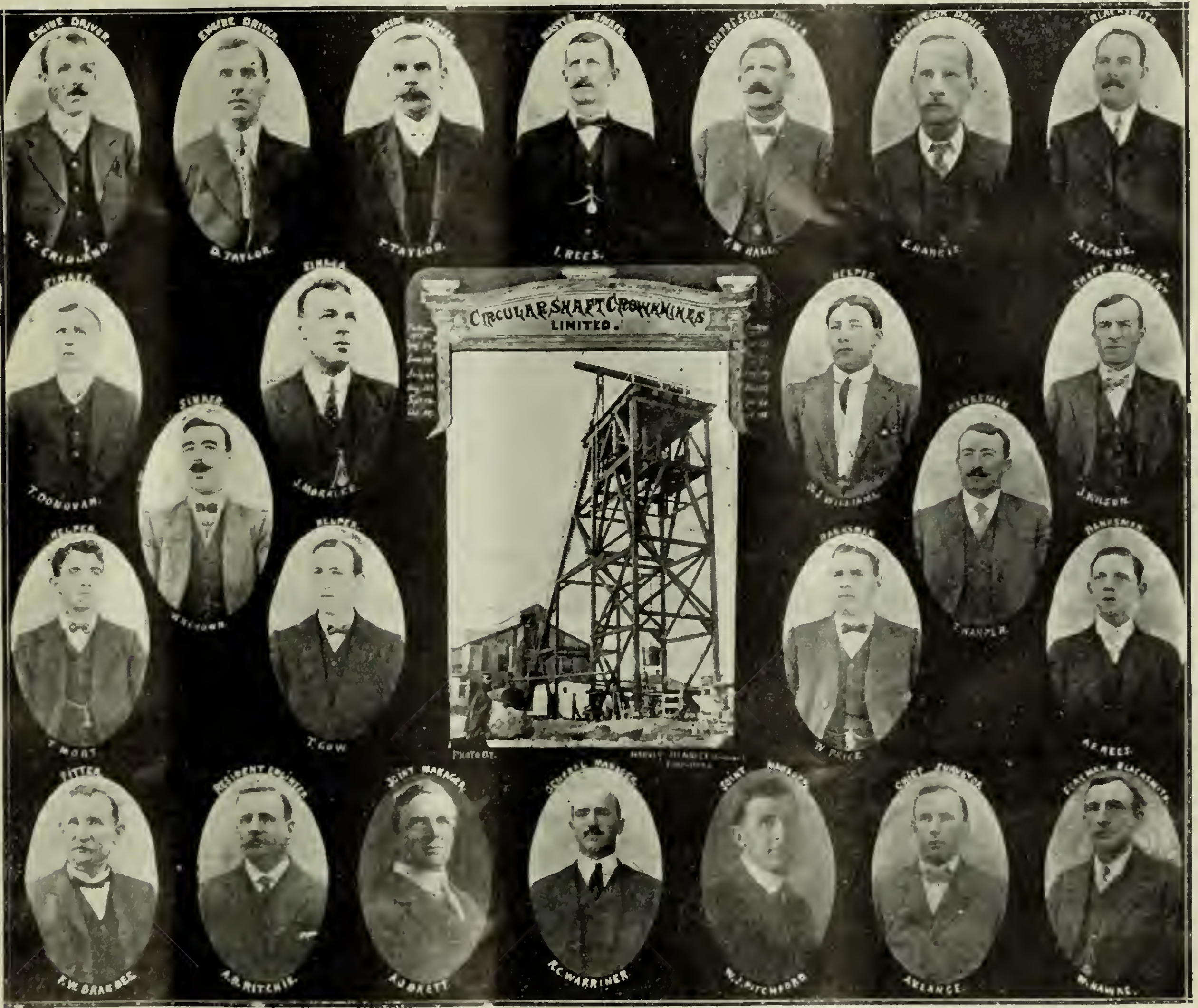
Lecture by Dr. Irvine on the "First Aid" Organization at the Crown Mines, and Its Lessons.

DR. Irvine lectured at the Mining Exhibition on Saturday evening on "First Aid." Not only should every mine have its first aid corps, but it should have its ambulance officials, he said. On the Crown Mines they have these ambulance officials. There are six of them. They are half-time officials, but they are on the paid staff of the company as ambulance officials. The shifts are divided among these men, and each is responsible for being in attendance at any accident at the particular shaft or shafts in which he is in charge. Moreover, the Crown Mines has about fifty men outside these ambulance officials who are "in the game" for the love of the thing. That is not to say that the ambulance officials do not also love their work. But the Crown Mines think it worth their while to remunerate a certain number of men, that is to say to have them set apart for the work. Nowhere does ambulance work on any of the mines appear to be organised as it is at the Crown Mines. These fifty odd voluntary workers are doing excellent work. Not only do they attend classes officially held on the mine, but they have classes on their own, and they have shown by their interest in the improvement of the ambulance equipment that they are very serious students. Mining companies have given generous support financially to the first aid movement, just as they are now backing the "Safety First" campaign. But financial backing is not enough. It does not satisfy Dr. Irvine. He would like to see all the other mines follow the example of Crown Mines. Nor does he think that it is enough that the Government should require a certain number of men to have certificates. Assuming that the majority of the accidents which occur in mining are due either to carelessness or ignorance, Dr. Irvine contends that the majority are to a large extent preventable. That was what "Safety First" meant. If employees and junior officials were trained to look after accidents it would necessarily follow that their attention would be drawn to the causes of the accidents and so to their prevention. In the teaching of first aid there are three things which Dr. Irvine thinks necessary. He would insist that the societies which grant certificates should see that their certificates are [illegible]. In other words, societies should not allow candidates to obtain a certificate by the skin of their teeth [illegible] their numbers and make a big annual report. He would also insist that everybody who takes up first aid should take it up seriously. In this connection Dr. Irvine points out that there is nothing in it that any intelligent man cannot learn if he gives his mind to it, but he has to give his mind to it. And he thinks that every great industrial organisation, and especially every mining company, should undertake its ambulance work as a department of its ordinary business organisation. In other words, the movement should not be left to voluntary individuals, though the utmost use should be made of any voluntary enthusiasm that is going. This is a further plea for a system like that at the Crown Mines. The only criticism that Dr. Irvine offers to the "Safety First" movement is that it has been a long time in coming. It was bound to take precedence of first aid in the sense that prevention is better than cure. Both movements, however, are required, because however perfect safety measures may be, they are always going to break down somewhere. Progress in first aid in the last few years shows that it has come to stay, and it has now come to be regarded as an essential element in the life of every industrial community. If seriously taught, studied and properly organised it will gain an increased measure of public confidence every year, and so justify its existence more and more. Few mines have organised their ambulance work at all, and in view of the number of accidents which occur every year it is their duty to do so. That, as stated, was the main theme of Dr. Irvine's lecture on Saturday night—a lecture which was cordially appreciated and which was made the more interesting because of the practical illustrations which Dr. Irvine gave of ambulance apparatus, assisted by a smart team from the Crown Mines. Dr. Irvine says it is good business to organise first aid properly both from the financial and humanitarian point of view.

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of April, 1914, is as follows:—Reef—Mill: Gold won (fine), 111 ozs. 19 dwts. 10 grains; tons crushed, 943; value, £1,742 15s. 11d. Concentrates (estimated): Gold (fine), 11 ozs. 6 dwts. 0 grs.; tons, 7.5 (also contains silver and lead value £12 1s. 3d.); value, £60 15s. 6d. Cyanide: Gold recovered (fine), 7 ozs. 0 dwts. 0 grs.; tons treated, 27; value, £29 8s. 0d. Alluvial: Gold recovered (fine), 1,129 ozs. 8 dwts. 11 grs.; cubic metres treated, 91,679; value £4,743 10s. 10d.

THE GENERAL MANAGER AND STAFF OF THE NEW CIRCULAR SHAFT: CROWN MINES, LTD.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D. TAYLOR.
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T. TAYLOR.
MASTER SINKER.
I. REES.
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Mr. W. Frecheville and the Future of the Rand.

In his speech at the Anglo-French Company's meeting, seconding the report, Mr. W. Frecheville sounded a strong rallying note regarding the position and outlook on the Rand. "Mining," he remarked, "is not all trouble and disappointments, and there are prospects of economical improvements. For instance, the leaders of the Rand industry are very properly giving a great deal of attention to the health of those working underground, and to my mind that is the key to the whole position. As long as the mines are unhealthy and the work is unhealthy, there will be labour troubles, and when the work is healthy there will be plenty of labour at reasonable rates. With regard to the removal or slackening of the colour bar, which is now so rigorously enforced, one feels that the standard should be one of competence and not of colour. Blacks are employed in all kinds of labour in other countries with success, and if they are capable of doing the work, one sees no reason why they should not be employed for other kinds of labour on the Rand as well. Another point in which improvement may be expected is in the extension of the use of small rock drills in mining. There is a tendency to use them more and more, and one cannot but think that mechanical science will prove equal to the occasion and will supply a thoroughly serviceable little stoping drill, which everyone out there is looking for, and if it does it will prove a huge boon to the industry. Among all the troubles which we hear of as affecting the industry in the Rand it is very gratifying to notice that these troubles are not inherent to greater depth. There have been troubles of all kinds, but they have not run against the trouble, which would be a very serious one, of depth. They are successful in dealing with the difficulties which arise in connection with the great depths to which the mines are now attaining. They have troubles in ventilation, for instance, but those are troubles which coal miners have coped with successfully for a long time past, and if those connected with the industry on the Rand go to the coal miner they will find out how to deal with ventilation difficulties. The past year has not been a favourable one for a finance company taking up new business, and I have nothing new in the way of mining investments to bring to your notice; but I may perhaps point out that the cloud of financial depression has at least a silver lining in this respect: that for those who have money it affords an opportunity for buying good investments at a reasonable rate."

S.W. TRANSVAAL DIAMOND FIELDS' APRIL OUTPUT.

A Slightly Increased Total—Detailed List.

The output of diamonds during April from the various alluvial diggings in the South-Western Transvaal amounted to 4,196¼ carats, value £18,415 6s. 6d., as compared with 3,865¼ carats, value £18,159 during the preceding month. Returns were registered from 37 areas. The details of the output are as follows:—

	Carats.	Value.		
London	577¼	£2,906	9	6
Bloemhof	722¾	2,831	17	0
Cawood's Hope ...	403¾	1,730	5	0
Panfontein	429¼	1,638	1	6
Kameelkuil	375¾	1,630	5	0
Dievedraai	326¼	1,480	0	0
Kareepan 164	236¼	1,412	17	6
Eastleigh & Goedgenoeg	302½	1,398	12	6
Rondevlei & Doornbult	142½	617	0	0
Rietput	134½	481	17	6
Koppiesvlei	96¾	368	17	6
Mooifontein	44¾	180	0	0
Avondster	46¼	170	8	6
Olivenfontein	29½	165	15	0
Eerstebegin	36¾	158	12	6
Modderkraal	30½	152	0	0
Doornbult 153	15	148	15	0
Vliegekraal	38¾	144	10	0
Diamantdoorns ...	37½	125	10	0
Kuilfontein	19¼	82	10	0
Vogelstruiskraal ...	21½	82	10	0
Christiana	20	65	10	0
Zevenfontein	15¾	64	0	0
Homansvlei	13	47	0	0
Zwartlaagte	14	43	0	0
Hamburg	13¾	42	10	0
Boschplaats 14	7¾	38	10	0
Kareepan 137	8¼	38	5	0
Maroetjesfontein ...	9	36	5	0
Rietkuil	5¼	27	10	0
Vanzylsdrift	3¾	26	5	0
Grootdoorns	2¼	21	0	0
Zoetfontein	4¼	20	0	0
Baviaanskraans ...	3½	15	10	0
Johannesrust	4½	11	0	0
Kromellenboog ...	3¾	10	7	6
Leeuwbosch	1¼	2	0	0
	4,196¼	£18,415	6	6

UNDERGROUND CONTRACTS v. DAY'S PAY AT DE BEERS.

Mines Department Inspectors Review Case for Abolition of Underground Contracts on the Rand.

In his report for 1912, Mr. Warington Smyth, Secretary for Mines, renews his attack on the contract system of underground payment on the Rand, and quotes passages against it from the annual reports of the Inspectors of Mines.

One Inspector of Mines says with reference to underground contracts:—It is generally recognised that the underground men as a class will benefit by a change to a day's pay system. It is a startling revelation to compare the monthly pay of some contractors with that of the day's pay men. I know of one developer who has been drawing £100 and over for many months, while the pipe fitter in the same mine has to be content with his 20s. per day. The developer in this case is certainly a hard worker, but it cannot be contended that his work is done four or five times as well as that of the pipe fitter. It is this unequal distribution of pay which is one of the causes of discontent on mines. An Assistant Inspector of Mines states:—To do away with the contract system and substitute the day's pay system would greatly reduce causes of friction between miners and the management, and would benefit the workers as a whole. Developers would have fewer machines, hence better supervision. More shiftbosses would be required, and as their pay of £30-£40 will probably be slightly more than the miners' as it should be, these appointments will become desirable, and it will not be difficult, as it is now, to get experienced men to fill them. With reference to the contract system, another Assistant Inspector of Mines makes the following remarks:—A mine captain is worried by his day's pay miners every day to be put on contract. In the case of developers where there is little likelihood of [illegible], I think that they should always be on contract. In the case of stopers I would prefer day's pay or a day's pay plus bonus system, a bonus being paid on the following points: (1) Breaking efficiency (hand or machine); (2) Stores used, especially [illegible]; (3) Condition of stope, especially as regards timbering and general safety. A man on contract thinks of nothing else than breaking the maximum amount of ground and regards timbering and the examination of his stope as irksome duties to be avoided whenever possible. I have no doubt that by doing away with the contract system the accident rate would decrease. Putting the men on day's pay [illegible] that they will want a minimum wage, and I suggest [illegible] for hammer men and 20s. per shift for machine men and a bonus [illegible] a good hammer man to earn 25s. and a good machine man [illegible] per shift. An Inspector of Mines from the East Rand [illegible] system:—It is true that day's pay men are [illegible] the mine captain or shiftboss, "When can I get put on contract?" But in support of day's pay it must be recorded that [illegible] years broke and handled their rock underground by contract. About 1907 or 1908 the company abolished all these contracts, and carried on the work on day's pay, with a result so beneficial to all concerned that the company never returned to the contract system. During the latter end of 1910 and until July, 1911, on the New Comet section of the East Rand Proprietary Mines, the breaking of ground was done on day's pay, whereas the breaking of ground on the other three sections of the East Rand Proprietary Mines was carried out under the contract system. The comparative returns of the four sections showed that the work done on day's pay was better in every respect than that done by contract. The arguments in favour of day's pay are far stronger than those against it, and I am of the opinion that all stoping should be placed on day's pay at a wage somewhat higher than a decent living wage, and this to be accompanied by increased supervision by making the shiftbosses' district smaller.

Dealing with this subject, the Acting Deputy Inspector of Mines, Kimberley, reported as follows:—*Contract System formerly in force at Kimberley.*—Separate contracts were given for each level of a mine for (a) breaking and filling, (b) development, and (c) tramming. In the larger mines separate contracts were often given for two parts of the same level, so that there would be in all six contracts on each level. Sometimes the contracts for breaking and filling and development were merged in one, the contractor for breaking and filling being obliged to do certain development. The contracts were verbal. The company had and exercised the right to cut prices during the contract, but the system was worked liberally by the company. According to the General Manager, the company did not cut prices unless the contractors were getting more than £60 or £70 per month each, and if a contractor had a bad month they on request temporarily reduced the amount of retention money or even frequently made up his losses, say, by paying the native labourers. Ex-contractors acknowledge the liberal treatment. Sinking and development were paid by footage, and breaking and filling per load. The contractors paid their white men and at one time their natives also, but later the company paid the natives and deducted their pay from the contractors' money. Contractors paid white men 25s. per shift, while the pay of the company's day men was 16s. 8d. only. The contractors sometimes gave bonuses to their men in addition, but statements vary as to the frequency of such payments. Managers and some ex-contractors say they were frequent, other ex-contractors and contractors' employees say they never knew bonuses to be paid by contractors. Contractors sometimes reduced their men's pay below 25s., but those cases were rare. Probably on the whole it made little difference to the men whether the contractors did well or not. Under the contract system natives were better paid than at present. They are said to have got 7s., 8s., or 10s. per diem, compared with 4s., the present pay. While successful contractors paid up to 10s. per diem, unsuccessful contractors could not do that. The best contractors could therefore get the best native workers, while the less efficient contractors had to put up with the worst natives. As part of the payment to natives was in the form of private bonuses, the company could not accurately estimate the contractors' costs, though as all stores, etc., were purchased through the company, it had otherwise a good check. *Objections to Contract System.*—(a) The loading of "dirty" ground was the main objection. Contractors paid by the load would put reef into their trucks, despite all the efforts of the officials. Apart from the loss to the company, much petty friction resulted. (b) Hanging back by contractors to prevent prices from being cut. According to the management and some ex-contractors, that was common, but other ex-contractors and men say they did not know of it being done. Probably it was common, as two ex-contractors told me that they did it themselves. (c) Difficulty of securing regular output of ground from contracts. The management states that contractors who had a good run of ground would make money during that time, but would not prepare other places, so that when the run stopped the output would become very small. On the other hand, one ex-contractor claims that the system had the advantage of making the men think how best to keep up the output, while now they depend on the officials. (d) Difficulties in arranging rates. Some contractors were more skilled and had better labourers than others, hence if a living wage was to be given to all, rates had to be varied and unpleasantness resulted. (e) Disputes between contractors. In these attempts to benefit themselves, contractors would sometimes injure others; for instance, a contractor knowing that ground was running well in a chamber on a level above would tap it into one of his chambers, or a contractor would "tipwind," *i.e.*, return an excessive number of loads as tipped into a pass, with the result that the sum of the various contractors' tallies would exceed the company's tally on the surface, and as the company paid only on its surface tally the honest contractors had to suffer. (f) Excessive number of white men. While some of the contractors worked hard themselves, others did not. The contractors were often out of the mine going to the bank, etc. (g) Risks taken. There is a consensus of opinion that under the contract system many places were worked and things done to avoid delays which would not have been done with day's pay. Accident rates were higher than now, but how far that was due to the labour system is not clear, for important changes in methods of working and in regulations and inspection have taken place. (h) Difficulty in securing good mining officials. The high pay earned by good contractors made it difficult to get good men to take positions as shiftbosses, etc., at fair rates.

Abolition of Contract System.—The contract system was discontinued at different mines between April and July, 1908. The change was made at the company's wish, but without serious objection from the men, who are said to have realised that times were bad, and that mines might have been closed. When the system was done away with day's pay was raised from 16s. 8d. to 20s., so most of the men lost 5s. per diem. The contractors lost much more. One tells me that he was making £50 to £55 per week, and became a shiftboss at £8 per week. The contractors for sinking a main shaft who protested when they were given a month's notice of termination of their contract were met by a promise of £750 bonuses to be paid when they completed the remaining 400 ft. on day's pay. The management claims that the company has gained all round by abolition of the contract system. The change is said to have resulted in increase of work done per man, reduction of costs, and increased yield of diamonds from the ground won. The management is emphatic that the work has been cheaper quite apart from labour-saving devices and reduction of wages.

Present Conditions re Miners.—The men are paid fortnightly. No notice prior to discharge is given unless a reduction of staff is foreseen. Discipline is strict and discharge for misconduct is prompt. The ordinary pay is 22s. 6d. per shift; 25s. per shift and a bonus is paid for shaft sinking. Fourteen days' leave per annum on full pay has recently been made a rule for men of one year's service. Little housing is provided by the De Beers Company for the actual miners who are mostly resident in Kimberley or Beaconsfield. There are a few exceptions, for the company owns a few rooms at Wesselton, and some of the company's houses in Kenilworth village and elsewhere are rented to miners. The company provides recreation rooms, grounds, etc., and contributes liberally towards measures for making life pleasant for its employees and others in Kimberley. The extent to which those contributions represent profits, made from sales to natives in the compounds, does not prevent them from encouraging contentment. Changes in men or officials are rare. Most of the present staff and employees have had very long service in the mines. Most miners, if questioned as to how long they have been in Kimberley, state a time somewhere about 25 years. One man whose experience I asked for in an accident enquiry said that the next month he would be in the mine 41 years. The mine officials have nearly all worked as miners or contractors in the mines. The Society of Engineers with 60 or 70 local members is the only trade union known to exist here. A Miners' Defence Society "to provide and pay from the revenue of the society for legal defence of any member against whom proceedings may be taken in a Court of Law in respect of any accident which may have occurred in connection with his employment" has for some years been established at each of the De Beers Company's mines. There are few disputes or complaints in the mines. Such as there are, the mine manager of the mine concerned generally settles without difficulty, and differences are only occasionally referred to the general manager. The general tone seems to be one of contentment with local conditions and adverse criticism of the way the mines are run on the Rand.

SOUTH AFRICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE arrangements for the annual session of the S.A. Association for the Advancement of Science at Kimberley, from July 6th to 11th, are now assuming final form. A strong local committee is at work at Kimberley, with Mr. Alpheus Williams, B.Sc., General Manager of De Beers Consolidated Mines, as Chairman. Under the chairmanship of the Mayor of Kimberley (Mr. E. Oppenheimer), a Reception Committee is arranging an interesting programme of events, including visits to the diamond mines, a garden party at the golf links, given by the ladies of Kimberley, a special excursion to Alexandersfontein, a luncheon by De Beers Company, an ambulance display and competition, and other attractions. The Kimberley Club and various local sporting clubs have extended the privilege of honorary membership to members of the association. In recognition of this scientific work in furtherance of research in South Africa, the President of the Association, Dr. R. Marloth, has been awarded the South Africa medal, and £50 by the South Africa Medal Committee, comprising twelve representatives of various branches of science elected by the Council of the Association, and representing the various Provinces of the Union, together with Rhodesia. The medal will be presented to Prof. Marloth at the close of his presidential address by one of the vice-presidents. The list of papers to be read at the session is beginning to assume presentable dimensions. Up to the present the following (some of which have been previously notified in our columns), have been promised :—Section A : Astronomy, Mathematics, Physics, Meteorology, Geodesy, Surveying, Engineering. Architecture, and Irrigation (Secretaries : Prof. A. Brown, South African College, and A. E. H. Dinham-Peren, P.O. Box 83, Kimberley). 1. Presidential address by Dr. A. Ogg, Professor of Physics, Rhodes University College, Grahamstown. 2. "On aspectrographic analysis of the Nkandhla meteorite," by Dr. J. Lunt, F.R.A.S., F.I.C., of the Royal Observatory. Section B. : Chemistry, Geology, Metallurgy, Mineralogy and Geography (Secretaries : J. G. Rose, F.C.S., Government Chemical Laboratory, Capetown, and J Parry, P O. Box 220, Kimberley). 1 Presidential address by Prof. G. H. Stanley, A.R.S.M., F.I.C., etc., of the South African School of Mines and Technology, Johannesburg. 2. "The origin and formation of the diamond," by Dr. W. Johnson, L.R.C.P., L.R.C.S., Bloemfontein 3. A geological paper by Prof. E. H. L. Schwarz, of Rhodes University College. 4. "The geological structure of portion of German South-West Africa." 5. "A rare mineral phosphate from Lobito Bay." 6. "Some fissure coals of the Western Province." This and the two preceding papers by Dr. W. Versfeld, B.A., D.Sc., of the Government Chemical Laboratory, Capetown. 7. "Chemical analyses of some cultivated Western Province soils," by Dr. B. van der Riet, Professor of Chemistry at Victoria College, Stellenbosch. 8. "South African plant poisons and their investigation," by Dr. C. F. Juritz, M.A., D.Sc., F.I.C., Government Analyst, Capetown. 9. "The chemical control of dipping tanks," by C. Williams, B.Sc., Chemist at the Government School of Agriculture, Cedara, Natal. 10. "A reversible photo-chemical reaction," by Dr. M. Rindl, Professor of Chemistry at Grey University College, Bloemfontein.

Durban Roodepoort G.M.

The Durban-Roodepoort G. M. Company has declared an interim dividend of 10 per cent.

Main Reef West.

The following reference to the Main Reef West Company, made by the Chairman at the meeting of the Klerksdorp "Props," will be of interest to shareholders in the Neumann concern: "On referring to the schedule of shares and debentures you will notice that there has been a very serious depreciation in the value of Main Reef West shares, which are valued therein at 7s. per share. As these shares cost originally 25s. per share, and your holding amounts to 28,000 shares, this is a very serious loss to face, but from first-hand information in our possession in regard to the future prospects of this mine your board is not disposed to take a pessimistic view, as the present experience of the Main Reef West is one incidental to mining in all countries, and is not altogether unknown even on the Rand. The recent disappointing development is almost entirely due to the broken nature of the formation now being passed through, but these difficulties I am sure will be overcome all in good time, and I feel confident that the company will, in the not too far distant future, resume its position in the list of dividend-payers, and for the present we can only exercise patience."

DYNAMITE ACCIDENTS AND THE "SAFETY FIRST" CAMPAIGN.

Mr. Cullen's Warnings—"Co-operation from Top to Bottom."

THE Lecture Hall at the Mining Exhibition section of the Drill Hall Buildings was crowded on the occasion of a lecture by Mr. William Cullen, manager of the Modderfontein Dynamite Factory, on explosives. Mr. Neuhaus, Chairman of the Safety First Committee, presided, and in the course of his introductory remarks expressed his horror at the number of accidents which took place on these fields, and at the carelessness which was responsible for the great majority of them. Mr. Cullen pointed out at the outset that he had been compelled to go outside of the usual rut in order to avoid clashing with Messrs. Archbold and Girdler Brown, who had between them covered a good deal of his ground. If some of the theories which he advanced were thought worthy of further consideration, then he should be prepared to transfer them to the more debatable atmosphere of the scientific societies, but meantime a great many problems in connection with blasting require investigation, and he had no doubt whatever that it would be much more for the benefit of the mines than for the explosives companies if these problems were tackled in a thoroughly sound scientific manner. After all, the consumption of explosives might be reduced temporarily, but inasmuch as this would broaden the basis of mining, the explosives companies would benefit in the long run. Proceeding, he stated that at a time like this, when the public conscience and public interest had been aroused by the Safety First campaign, recrimination and blame should be put aside. It was only by what the Americans called team work that anything great was accomplished, and this was a time for team work if ever there was. He would like to see a Safety First team on every mine—not made up of officials but of working men. He was not a great believer in formal lectures. Rather did he favour small informal "pow wows," but the "pow wower" must be a man who knew his job. He must have abounding patience, and above all he must be a good fellow. He would strongly advise the mines to get one or two such men and to pay them well. After recounting his own early experiences when lecturing on the mines, Mr. Cullen passed on to his subject proper. The first point he considered was "fuse lighters." He burned in a glass jar a small quantity of blasting gelatine, which produced a very large amount of nitrous fumes. It was because of these fumes that the old cheesa stick stood condemned. He next proceeded to demonstrate how essential it was to have a cheesa stick which would remain alight under the most trying conditions—as a man's life frequently depended on the light of his cheesa stick. Incidentally he brought out the fact that a really satisfactory cheesa stick was very difficult to produce. He next passed on to the question of exudation, which, he stated, had in the past received practically no consideration from users. He explained how exudation was caused, and how dangerous it was under certain conditions. He was firmly convinced that many unexplained accidents were due solely to exudation, and although miners in many parts of the world liked "wet gelatine," it should on no account ever be used. Proceeding, he directed attention to the attempts not infrequently made to jam cartridges into a hole too small for them. This in itself was, of course, a danger even with a wooden tamping rod, but it was increased tenfold with exudation.

He next passed on to a somewhat lengthy consideration of fuse. Broadly speaking, he thought that the quality supplied on these fields was good, but he would like to see a better quality used, and better certainly with regard to regularity of burning speed. Such a fuse as he had in his mind might cost 1d. per coil more, but what was that compared to the occasional hanging up of a round or bench? Incidentally, he explained very clearly how certain conditions might produce a so-called running fuse—but he was very definite on the point that there was no such thing as a running fuse. In this connection he showed at the end of the lecture a very striking experiment, which demonstrated clearly how easy it was to produce by pressure an accelerated velocity of burning speed which might be characterised as "running fuse." He next passed on to the question of premature explosion, and although he stated that his ideas were for the greatest part theories, they had a very large measure of probability, and certainly what he had to say in this connection gave room for thought. Regulation No. 106 (22), which he read and which has to do with the interposition of tamping between cartridges, he supported strongly and showed clearly by experiment and example that the practice is highly dangerous and ought to be condemned. Although experiments which he had himself carried out did not support this view, still all explosives were not equally sensitive, and it was surprising what small things could lead to unexploded cartridges being left in the hole. This led on to the subject of sensitiveness, and his remarks in this connection were most instructive. Probably more accidents were the result of drilling into unexploded cartridges than any other cause, but after examining the various proposals which had been advanced to obviate this, he had reluctantly come to the conclusion that none of them were infallible, and this being so, they would only increase present dangers. Mr. Cullen next passed on to what he said was a most important point, and one to which insufficient attention was given, namely, the proper storage and handling of detonators. He contended that a very small quantity of sawdust could prevent the spit of the fuse reaching the detonator composition, and this in turn could lead to all sorts of dangers. He stated that "damp storage" was far more inimical to detonators than actual immersion in water even up to an hour, and this anyone could try for himself. He also mentioned that if through carelessness the end of the piece of fuse got wetted, most probably the detonator would not go off. This could also be easily demonstrated. He next met some of the objections which had been advanced against the use of the so-called Nowag clip. In practice in a great many of the mines the cartridge was not properly affixed to the fuse and detonator as is provided by the regulations, and the clip was an easy way out of the difficulty. A large number of views were next thrown on the screen, and as they passed along Mr. Cullen made each the subject of a few interesting remarks.

Vaal River Gold Fields, Ltd.

The following circular has been issued by the secretary of the Vaal River Gold Field, Ltd.: "In view of the fact that the debenture holders have appointed a receiver, I am instructed to place before you the following particulars as regards the present position of your company, viz.: You are already aware that during the last year your directors have encountered very great difficulties in getting to work at the mine, which difficulties were caused partly by delays in the erection of the battery, and partly by want of adequate funds. At the commencement of the present year your directors were advised by their manager that, provided a certain amount of money was remitted promptly, crushing could commence at an early date, and, after due consideration, your directors thought it would be to the benefit of shareholders generally that this money should be remitted, and that the debenture holders should be asked to wait for a short period for the payment of the half year's interest, which became due on January 31 last. On March 27 a cable was received from South Africa, which read as follows: 'Crushing has started; mill working splendidly.' The greater number of the debenture holders who were approached on the subject at once expressed their willingness to allow payment of the debenture interest to stand over for the present, but certain debenture holders having intimated their intention to take extreme measures against the company, it was thought desirable, in the interests of everyone concerned, that a receiver should be appointed by the trustees for the debenture holders, the Oceana Development Company, Ltd. The Oceana Development Company are the holders of £2,500 debentures and 20,000 fully paid up shares in your company. My directors are in close communication with the receiver, and shareholders may rely that whatever steps may be taken in the future, the debenture holders will not in any way benefit at the expense of the ordinary shareholders in the company. From the above you will see that the appointment of a receiver is in no way detrimental to the interests of the ordinary shareholders. In the meantime, I am informed that the receiver has remitted the funds necessary to keep work going at the mine."

Klerksdorp Proprietary.

At the annual meeting of the Klerksdorp Proprietary Mines recently the Chairman, referring to the proposal (which was subsequently carried at an extraordinary general meeting) to make a cash distribution of 2s. per share and reduce the capital to one-third, said that several of the largest shareholders in England were decidedly averse to the proposal, their contention being that the cash might be profitably employed for the benefit of shareholders. "However" (he proceeded "we were agreed that if all the shareholders could be consulted, the concensus of opinion would probably be in favour of a distribution, and acting on that assumption, we decided in its favour, and you will see that in arriving at this decision we have determined to give you, not a proportion of the cash we had in hand, but the whole of it. Certain of our assets have been realised since the closing of the books, and I am pleased to inform you that the total amount of cash required to be distributed and amounting to £55,666 is now in hand, and, further, I am sure the reduced capital of the company will be closely represented by your remaining assets."

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NOTABLE DISPLAYS AT THE MINING EXHIBITION.

Details of Some More Exhibits Described.

Marten's Traffic Indicator.

The object of this device is to provide means to enable the driver of a motor car, or other road vehicle, to give notice of his intention to turn, stop, and the like. The signals are given by means of electric lamps which illuminate visual signals. The letters, "R," "L," "S," "T," indicate respectively the driver's intention to turn into a cross road on the right or left hand, to stop or turn in the street. When no signals are showing, the driver intends to go straight ahead. There are two sets of such lamps, one at the rear of the car, for observation by following cars, and one at the front for signalling to pedestrians and persons controlling the traffic. This system may be extended to any number of signals. The lamps may be placed separately or in a cluster. The switches may be placed in any convenient position. A pilot lamp placed in the circuit indicates the circuit is in order and should be visible to the driver. A horn or bell may be placed in the circuit, and serves the double purpose, first, to warn the public that a car or vehicle is about to turn, and secondly, it reminds the driver to discontinue his signal when finished with. The time has come when some safe system of signalling should be introduced. Traffic has become so fast, it is almost impossible to go in any direction with safety, as other persons are not aware of the driver's intentions. At night, with hood up and curtains down it is impossible to notify anybody of your intentions, and this trouble is intensified on wet and windy nights. The cost is small, for installation about £4 to £5. A cheaper insurance rate should be obtainable with a safety measure and accidents should be reduced to a minimum.

The Lancelot Ussher Patents.

The interest of practical men along the Reef in the Mining Exhibition at the Drill Hall has been remarkably well maintained. While the level of the exhibits is very high, of course some attract more interest than others. The place is never without a good sprinkling of interested visitors during the day, but at night the men from the Reef come in great numbers and are very free in their criticism of the inventions displayed. Probably the exhibit which attracts the most ardent attention is that devoted to the Lancelot Ussher Patents. Night after night one finds people crowding four deep round this table. Compliments upon the unusual cleverness, originality and at the same time extraordinary simplicity of these inventions are showered on the patentees, and many a miner is voluble in his praise while recounting his own experiences of their use. Time and again one finds a man coming back with friends whom he wishes to see the various inventions. Then he starts demonstrating the virtues of an Ussher clamp or shows how a drill hose can be mended in 30 seconds. Then there is a wealth of interest in watching how each man will pin his faith to one or other of the devices as the pick of the lot. The first will recall the many hours he has lost when wrestling with a recalcitrant bolt on a rusty safety clamp and tell how he has spent half-an-hour of every working day tightening up or slacking its rapidly wearing nuts and bolts. Then he will borrow the hammer and with one whack show how the Ussher Safety Clamp can be released in half a jiffey and be knocked into place again in less than "two twos." The second is voluble in favour of the drill hose clamps because they can be fixed in half a minute and no tools are needed, while his friend says the menders are even better than the clamps because they are the only kind with which you can repair your hose without having to cut it in two, and which make a good job without the need for any internal pipe. "And, besides, they cost less than a third of the old kind," adds another. A little while after a tall intellectual-looking engineer strolls up with a party and wants to show them "the quickest pipe joint in the world," and tells them that the Ussher joint can be made sound in fewer seconds than any other takes in minutes. Before he has finished you will overhear another holding forth on the wonderful simplicity of the new saddle clamp which is a sort of split tee-piece. A union may be made with this invention between two pipes in less time and at less cost than by any other method. The existing water or air pipe is tapped at any point and the new branch simply clamped on. The next man waxes enthusiastic over the neatness and rapidity with which he stopped a burst air pipe with an Ussher clamp when the only tool he had to do it with was an old jumper and the "tail of a nigger's shirt" for packing. "And I did the job in less than three minutes and saved wasting the whole shift." Yet another visitor selects the infection preventing tap with its broad black hood made so that when turned down it is impossible for even a Kafir's lips to foul the tap or leave microbes behind, and when reversed becomes a "bubbler" providing a running stream or cup of water giving no chance of germs being collected. This tap cover, too, is made so as to be fixed easily to any tap on the same clamping principle. Last of all comes the fat man, redolent of good humour and prosperity, and one wonders what he will select as the very best of the inventions. His mind is rapidly made up when he sees the little clip snapped on to the motor wheel, and observe how it holds the pump for inflating the tyre in the very position that makes that hard work easy. "Why, you don't even have to wrinkle your waistcoat, and there isn't the chance of a backache in it," he exclaims as he asks where he can buy one quickest. One and all agree that for local inventions locally manufactured, for the variety of their ingenuity, for the wonderful saving of time and money, and for a hundred similar reasons, the display is easily the finest and most interesting in the place. And most of them murmur: "They are so simple and so easy when you know how, but why didn't I think of them myself years ago." It is interesting to know that everyone of these inventions, as well as a number of others, has been devised and worked out by Mr. Lancelot Ussher and Mr. Armour Hall, in Johannesburg, who work in collaboration, since the last year's Mining Exhibition.

The Robertson Mill.

The Robertson roller mill, which it is said can take the place of the tube mill, is running satisfactorily in the Mining Exhibition, and full particulars of it can be had on application to the inventors at Stand 19 in the Exhibition.

The Nelspruit-Graskop Railway.

By the formal opening of the Nelspruit-Graskop railway line on Monday, the Pilgrims Rest areas, which with Marabastad constitute the oldest goldfields in the Transvaal, have been brought almost into full railway communication with the outside world. Graskop is nine miles from Pilgrims Rest, and completion of the line right on to that township has been prevented by the exceedingly mountainous nature of the country. Mr. A. B. Roberts, the Provincial Secretary, who performed the ceremony of declaring the line open, in the course of his speech, expressed the hope that electrical or steam communication might some day be effected between Graskop and Pilgrims Rest. In congratulating Mr. Dempster, the resident engineer, on the successful achievement of his task, Mr. Roberts said that the estimate had originally been made on the basis of employing natives, but white labour had been employed, and a saving of £30,000 had been effected on the estimates. The reason for that, Mr. Dempster had assured him, was that he could do better and cheaper work with white men than with natives. If Mr. Dempster could accomplish that, then, said Mr. Roberts, he had done something far more important than building a railway. The white men employed had earned an average of 8s. 6d. a day, and some of them earned as high as 13s. 6d. That was a great thing, and it encouraged the hope that the white unskilled labourer might at last come into his own.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

First Aid versus Safety First.

To the Editor, *South African Mining Journal*.

Sir,—I am obliged to your correspondent, Mr. W. Lacey for the criticisms he has offered on one or two passages in the Red Cross Society's Manual on " First Aid in Mining," because the fact that he, as he said, became confused over the chapter on " Accidents from Poisonous Gases," plainly shows that I have not made myself as clear as I should have done. He raises several points, which I shall take seriatim. First, as to his claim that " Safety First ought and must take precedence of First Aid." Of course it ought. No one doubts that prevention is better than cure, but, even with the best preventive measures in the world, accidents, I fear, will always happen. And that is where First Aid comes in. All the king's horses and all the king's men in the way of safety measures will not help an injured man when he has been hurt. The two are complementary, not antagonistic, and both are necessary. But surely there can be no " *versus* " in the matter. Second, as to his difficulty in regard to CO_2 and CO in the causation of gassing accidents, let me try to explain very briefly what happens. When a charge of gelatine has been exploded in a winze, or drive, or rise, these areas are immediately filled with a mixture of CO_2, CO (each in varying but small percentages), and air. This mixture at first is lighter than air because it is heated. It probably, however, takes only a matter of a quarter of an hour or so for the mixture to become cooled. It is then, as analysis shows, slightly heavier than air (say 1·1 or thereabouts), in proportion to the amount of CO_2 present in the mixture. Suppose this mixture is in a winze. It will tend, when cool, to gradually settle down out of the winze, fresh air gradually passing up. But it will settle down as a mixture. A mixture of gases of different densities is not " subject to the laws of gravity " in the sense that sedimentation takes place in it in layers according to the relative density of its components, so that the heaviest gas will come down first. The atmosphere is a mixture of nitrogen, oxygen, and CO_2, but the CO_2 does not lie on the surface of the earth separated out from the oxygen and nitrogen. Rises, I suppose, are nearly as common in our mines as winzes, but the great majority of gassing accidents occur in winzes, because the mixture of gases formed by explosion, being when cooled slightly heavier than air, tends, unless it is blown out, to remain for a considerable time in the lower part of the winze. But it remains there as a mixture, and the reason why the predominant cause of gassing in winzes is CO is that that element in the mixture is immensely more poisonous than CO_2. Mr. Lacey is wrong in saying that rises " are not mentioned as likely points of danger." He will find " winzes, rises, drives, and other close places " mentioned together on p. 83 and " winzes or other close places " on pp. 72 and 75. Third, as to the effect of CO_2 on the flame of an acetylene lamp. I first noticed a reference to the " tenacity " of an acetylene flame in the presence of percentages of CO_2 sufficient to extinguish a candle, in an American scientific journal. I asked Dr. James Moir, who was interested in the matter, to confirm the results stated by experiment. He very kindly did so, and he found, as I have said, that in a mixture of 30 per cent. of carbonic acid gas and 70 per cent. of air, an acetylene lamp will still burn with a feeble luminosity. Such a mixture would consist, roughly, of CO_2 30 per cent., O_2 14 per cent., and nitrogen 56 per cent. The flame was extinguished by a mixture consisting roughly of CO_2 50 per cent., O_2 10 per cent., and nitrogen 40 per cent. The 50 per cent. of CO_2 was not found down a mine, but was produced in Dr. Moir's laboratory. I may be wrong, but in view of these results it is perhaps permissible to attribute the extinction of an acetylene lamp in the atmosphere of a back stope, to the possibility that enough water was not reaching the carbide, or that the latter was used up. If Mr. Lacey will confirm his observation, I am sure that Dr. Moir will be willing to repeat his experiment. Fourth, regarding the remark on the best means of escape from the fumes of gelatine burning in bulk, I confess that when I wrote the passage quoted I was thinking of stopes through which the air current was upcast, and so far I humbly stand corrected. But I am not so sure that, if a large quantity of gelatine went on fire and exploded in a drive, it would not be in many cases more easy to get ahead of the fumes by getting down a stope and rapidly clambering down it, than by attempting to reach a stope above, or by trying to rush along the drive ahead of the fumes. The fumes would be more quickly diluted and rendered less dangerous in the immensely greater area of the stope. However this may be, I own that this particular passage may require reconsideration. I trust that Mr. Lacey will accept my thanks for his frank criticisms, and that he will allow me to express the hope that, after the above explanation, he will be successful in obtaining " the necessary certificate to fulfil Mine Reg 277 (3)." Finally, I must apologise for the length of this letter.—Yours, etc.,

LOUIS G. IRVINE.

Crown Mines, May 20th, 1914.

Form for Missed-Hole Reports.

An ingenious method for reducing the probability of missed-hole accidents was adopted in sinking the Monarch-Pittsburgh shaft, at Tonopah. The idea is not entirely new, having been used in the Cœur d'Alenes previously. A blank form was placed in a conspicuous place of the change house, and in the rectangle a plan of the holes in the shaft bottom was made. The shift coming off after blasting, marked rings around the dots representing the holes which it was suspected had missed, and each member of the shift signed below. The shift coming on also signed at the bottom as an indication that each member had examined the diagram. Two purposes were served by this device. (1) the new shift was forced to receive information of the possibly dangerous holes; (2) the liability of the company to damage suits was decreased, since the signatures of the men would show that they were aware of the presence of the danger. The usual method of leaving the record of suspected holes on a blackboard for the new shift to read, is never satisfactory. The shift which has just blasted is usually in too much of a hurry to chalk up the missed holes and the shift coming on frequently does not bother to read anything that has been written.

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RHODESIAN GEOLOGICAL SURVEY.

The Report of the Director for the Year 1913—Investigation of the Gatooma Area.

II.—EIFFEL FLATS AND SURROUNDING DISTRICT.

The survey of the Eiffel Flats was commenced by Mr. Zealley late in 1912. A preliminary report embodying an account of the geology and ore deposits of the Eiffel Flats and an outline of the geology of the surrounding district has been published (Bulletin No. 1). A large area extending from Concession Hill southwards towards the Umsweswe River and westwards to the railway has now been completed. Mr. Zealley's report shows that his first results are in general confirmed and amplified. The north and western parts are underlain with greenstones with elongated bodies of felsite and one or two narrow belts and masses of banded ironstone. Mr. Zealley finds some evidence for thinking that there may be two groups of felsite of slightly different age, as Mr. Lightfoot has suggested in the case of the Golden Valley district. Some of the banded felsites are here also stained with iron oxides in the weathered zone, and are difficult to distinguish from the oxidised banded ironstone. In fact, some of the rocks commonly called banded ironstone are doubtless of felsitic origin. Further, it now appears that some of the rocks commonly called grits, and accepted as such in the traverses made in 1912, are in reality varieties of the felsitic magma. These rocks contain intercalations of fine-grained felsite and felsophyre, and in places are highly felspathic, grading into undoubted felsite. The coarser grained portions rich in quartz are probably "ultra-acid" varieties. As seen at the surface in their weathered condition, they strongly resemble grits or even conglomerates. The fresh or unoxidised rock from below water-level has not yet been encountered. The types of ore deposit, chiefly replacement ores in the greenstones, found in this portion of the district have been described in some detail in Bulletin No. 1, and need not be referred to further in this place. The southern and eastern parts of the district are underlain by a gneissic granite, which is intrusive into the greenstones mentioned above. There is a common belief in this country that granite areas are barren of metalliferous veins. This belief certainly requires some modification; at any rate, in so far as the banded granite is concerned, for throughout that portion of the granite mapped gold-bearing quartz veins abound.

Gold Reefs.—The reefs are particularly numerous in several positions ranged near the edge of the granite, *e.g.*, near the Umsweswe River near Sable Hill, the Maratonga near the Etna Mine, and the Mombi east of the Inez Mine; whilst in two positions further into the mass, namely, around the junction of the Mombi and Dimbula Rivers and around the north-east beacon of the Renny-Tailyour Concession, gold-quartz veins have been found in some numbers. Barren veins are very abundant. Mr. Zealley's studies of the worked veins show that nearly all of them have been subjected to a re-opening of the fissure, and the deposition of a central layer of white coarsely crystalline quartz, which is generally barren of gold, but contains occasional patches in which coarsely crystalline sulphides and gold are present. This central zone is frequently wide, and although variable from point to point, is usually much wider than the side zones, whereas the latter, formed of finely granular laminated quartz, are typically narrow, but rich in gold and sulphides. In both kinds of quartz the sulphides are the same. Galena, blende and pyrite are practically constant in their presence. Copper-bearing minerals are uncommon as a rule, but in one case are abundant. Scheelite is also an occasional constituent, whilst coarse aggregates of antimonite are present in one instance. The veins commonly have a small angle of dip, which results in their producing at their outcrops a considerable width of "rubble." Most of these rubble patches have "ancient workings" on them, in the form of a cluster of shallow circular depressions. These were pegged shortly after the occupation of Mashonaland, and in some instances a fair amount of work done on them in order to discover the veins. Apparently, however, it was not realised in many instances that the "ancients" merely worked the rubble and innumerable shafts were sunk which, passing through the rubble, entered country rock, and were continued in it to some depth. Mere stringers were occasionally struck and prospected, but these obviously did not afford the auriferous rubble. Such claims were abandoned. During 1913 a number of these claims were re-pegged, and in some instances already skilful prospecting has led to the discovery of the parent lode or lodes. There are other ancient workings, however, which await exploration, and, judging from the promising appearance of the rubble and the extent of the workings, it is likely that profitable lodes exist in the vicinity. These observations by Mr. Zealley must be of interest to the prospector who wishes to exploit ancient workings of this kind in the most economical manner. The past exploration of the workings shows that the lack of a little observation and thought has sometimes meant failure where success might have been achieved. Trenching to the bottom of the rubble, especially towards the higher side if the rubble lie on a slope, and continuing the trenching up the slope if necessary, is likely to uncover the parent lode in the case of such ancient workings as those described above. In other districts, however, the ancient workings are arranged in a line. These workings are probably on the reef, and cases have occurred where the first explorer of the workings failed to find the reef because he trenched across them only, and did not bottom them by a shaft to find out on what the "ancients" left off working.

Asbestos.—Some work has recently been done on several veins of asbestos situated in the north-west corner of the Renny-Tailyour Concession. The country rock consists chiefly of chlorite, which has probably been derived from hornblende. The asbestos is a hornblende asbestos, unlike that of Victoria, which is the valuable chrysotile. The hornblende asbestos has great length of fibre, six to nine inches being common, but the fibres are more brittle in chrysolite. They are arranged parallel to the length of the veins, which are generally less than twenty feet long and six inches in width. Only a small quantity appears to have been exposed at present. Malachite and aurite, the alteration products of nodules of bornite, are present in small shattered zones alongside the asbestos, and coarse gold was also detected. Although several masses of serpentine and peridotite are exposed in the district, no asbestos was found in them.

(*To be continued.*)

Latest Rhodesian Mining News.

The report of the Hanover G.M. Syndicate states:—In all a total of 948 feet of development was accomplished during the year, chiefly on the two Teutonic blocks. A fair amount of rock, of low, though payable grade, has been proved in the Teutonic No. 1 block, and further work will be undertaken there later on. Encouraging prospects have also been shown on the Thorn, North, and N'Kongese reefs. The chief operations were confined during the period to the Teutonic No. 2, where the main shaft has been carried down to 340 feet, and where good values still continue to be developed. The question of the re-opening of the Hanover Reef is now under consideration, and certain preliminary work connected with the clearing out and repairing of the old shaft has, in fact, already been put in hand. Dividends aggregating to 120 per cent. were paid during the year.

The line built for the Falcon Mine by Messrs. Drayton and Wotherspoon is now completed. The one from Indwa to carry the lime flux is seven minutes from the Blinkwater Railway, and the one from Iron Mine Hill to carry the iron flux four miles. The contractors, so it is understood, have completed the work in the short time of two months, nearly a month ahead of their contract time. They employed as many as 700 boys on the work.

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Engineering Notes and News.

THE FENCING OF MACHINERY.*

WE have received from Mr. W. Sydney Smith, H.M. Inspector for Dangerous Trades, a copy of his report on Fencing and Safety Precautions for Transmission Machinery, which has been drawn up with the object of enabling those who will be affected by the proposed new regulations, which will be based on Mr. Smith's observations, to consider the proposals and make any suggestions they may care to offer before the regulations are put into force. As these rules will be an epitome of the best modern practice in the way of prevention of accidents from transmission machinery, we give below the gist of Mr. Smith's suggestions. The full report can be obtained from any of Mr. T. Fisher Unwin's agencies abroad at the price of sixpence:—

SHAFTING.

It is a dangerous fallacy to assume, as is often done, that slow-running shafts, or ashfts of large diameter, are free from danger and need not be safeguarded. Every shaft is required by the Factory Acts to be securely fenced, irrespectively of its speed or size, unless it is equally safe by position or construction as if it were fenced. Unfenced smooth shafting of 12 in. in diameter and shafts running at less than 20 revolutions per minute have been responsible for fatalities. A fatal accident has been recorded from a shaft running at only 5½ revolutions per minute. A boy of 13 and a man of 65 were severely injured (1908, 1909) by shafts running respectively at 14 and 12 revolutions per minute. In each case loose clothing (waistcoat, apron) was responsible for these accidents. It is essential to prevent accidental or unintentioned contact with any revolving shafting. The following rules should apply to horizontal, vertical and oblique shafts: (1) Shafts less than 6½ ft. above the floor level: Every shaft to be securely fenced. (2) Shafts more than 6½ ft. above the floor level: Those parts to be securely fenced which are less than 6½ ft. from any point (work-bench, platform, shelf, cupboard, machinery, boiler, plant, pile of goods, ladder, or other structure) to which workers may need occasional access for such purposes as: (i) lubrication, cleaning, manipulating belts, or other work of maintenance of transmission machinery; or (ii) limewashing, painting, electric wiring, cleaning windows, opening or shutting windows, or any occasional work other than the work of maintenance of transmission machinery; except where: (i) the shaft is stopped at the time any worker approaches within 6½ ft. or it; or (ii) the shaft is moving at less than six revolutions per minute at the time any worker approaches the transmission machinery for the purpose of adjusting belts, and due provision is made (by signals or otherwise) for prompt stoppage at the first sign of danger. These rules are embodied in the proposed regulations requiring shafting and other parts of the transmission machinery "within reach" to be securely fenced, if in motion. The phrase "within reach" is defined as meaining "within a distance of 6 ft. 6 in. in any direction from any spot on which any person employed or working may have to stand or pass at any time, either in the course of his employment or incidentally thereto." A measurement in an upward directions only would not suffice. Dangerous transmission machinery may be "within reach" in a horizontal or even downward direction from the working place of a person employed, e.g., it may be near or below the level of the floor on which he has to stand; or he may have to work at the edge of a pit or on a ladder, with a risk of falling into unfenced machinery below. Although the definition makes no exception for an intervening fence of any kind, even a floor or wall, no difficulty can arise in practice since the requirement of secure fencing is already met. The type of fencing needed varies with the position and arrangement of the transmission machinery, but shafts are usually fenced either by complete or partial casings, consisting of fixed or loose sleeves, or by guard rails so placed as to prevent access. Tubes of sheet metal or millboard, sheet metal troughs, and wood casings make excellent guards. These may be attached to suitable brackets to such supports as pedestal bearings, hangers, wall boxes, overhead beams, walls, or flooring. Wire netting is sometimes similarly used, but is less cleanly than complete casings of sheet metal or wood. Millboard tubing, somewhat larger in diameter than the shafting, may be slipped over the shaft as a loose sleeve, which will revolve when the shaft is in motion, but will stop immediately if a person comes in contact with it. Millboard tubes are made of varying lengths, in halves or split on one side. The parts can be readily fastened together by means of thin wire or metal clips, which should be free from projections. Loose metal sleeves are often similarly used for fencing shafting and projecting shaft ends. When shafting is fenced with partial casings care should be taken that the revolving shaft is covered sufficiently by the casing. Many accidents have occurred on shafts protected on two or three sides, leaving the shaft exposed in one or more positions. Shallow partial fencing, such as a trough or single board placed under, over, or adjacent to shafting, is dangerous. For this reason complete casings are preferable to partial guards unless deep troughs of wood or metal are used. Whenever it is necessary to cross low lines of shafting fenced by rails there should be gangways or steps at suitable intervals so as to fence the shaft, with hand rails on either side of these crossing places. Where the shafting is high enough to allow passage underneath, but less than 6½ ft. from the floor level, the shaft should be completely encased at the passage ways. High shafting in motion must be approached from time to time by engineers, greasers, beltmen, and other persons employed in oiling, cleaning, adjusting belts, and similar work of maintenance. Where space permits there should be an overhead gangway or service platform, sufficiently near the shafting to admit of the necessary work being done in safety, and yet at such a distance as to prevent contract with transmission machinery in motion. In cases where approach to unfenced shafting is necessary, it is imperative that the speed of the shafting be previously reduced to a safe limit. A speed not exceeding six revolutions per minute may be considered safe for the dangerous operations of manipulating belts by hand on transmission machinery in motion, provided due provision is made by signals or otherwise for prompt stoppage at the first sign of danger.

COUPLINGS.

The danger of projecting bolt heads, nuts, screws, and keys has been previously mentioned. Such projections should be prohibited in all new installations of transmission machinery. Shaft couplings should be constructed with countersunk bolts and nuts, shrouded flanges, or other equally safe devices. In existing installations, as shaft couplings are generally situated near bearings, all projections should be covered by smooth wood or metal casings if the shafting is ever approached whilst in motion. Projecting keys of couplings, wheels, and pulleys should be covered with wood or metal caps if these portions of the transmission machinery are ever approached in motion. An exception, however, must be made for keys (feather or sliding keys) used in connection with sliding portions of the transmission machinery, such as clutches and sliding wheels.

COLLARS.

Projecting set-screws on shaft collars should be prohibited on all new installations. Countersunk set-screws or other equally safe method of attachment should be provided. On existing installations of transmission machinery, as collars are always situated in close proximity to bearings and loose pulleys, projecting set-screws should be removed, replaced by countersunk sot-screws, or covered with a smooth cap or guard if the shafting is ever approached whilst in motion.

WHEELS, DRUMS, AND PULLEYS.

All appliances of this nature, included in the term of "transmission machinery," if less than 6½ ft. from the floor level or any place to which the workers have occasional access, should be fenced so securely as to prevent accidental contact by persons with parts in motion, but appointed persons such as enginemen, oilers, and beltmen may be allowed to approach unfenced drums and pulleys for the necessary work of manipulating driving belts and ropes at times when the speed of the shafting and pulleys does not exceed six revolutions per minute if adequate provision is made for prompt stoppage of such parts at the first sign of danger. Gear wheels, if situated as above, should be encased with metal guards fully protecting the teeth and rims, with a portion of the guard hinged or sliding to facilitate lubrication of the teeth. Partial guards for gear wheels are always inadequate, and may be even dangerous; though the ingathering teeth may be protected, additional points of danger are introduced between the teeth and the ends of the guard, and fingers, clothing, or cleaning rags may easily be caught unless the teeth are wholly covered. Sprocket wheels for chain drives should be fenced like gear wheels, if similarly accessible. Friction gearing is equally dangerous as toothed gearing at the intaking parts. Fast pulleys near the floor level should be protected by guards which should also fence the loose pulleys and driving belts

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Overhead pulleys within reach of the workers should be fenced underneath with strong guards of metal or wood, which should be extended to protect the low-lying portions of horizontal and oblique driving bands in order to prevent accidental contact with moving parts, and especially at the intake between belt and pulley, which is the most dangerous part. Accidents are often due to contact with the spokes of pulleys and wheels in motion. Hence the sides of spoked pulleys within reach of workers, or to which they may have access, should either be fenced or the spokes filled in with circular discs to convert them into plate wheels.

BELTS, ROPES AND CHAINS.

As regards the fencing of belts other considerations arise. and the conditions are materially different from those of shafts and pulleys. Heavy overhead belts which may never be approached whilst in motion, and are to that extent safe by position, often require to be protected underneath as a safeguard in case of breakage; further, the fencing of the low belts driving the individual machines, e.g., looms, lathes, and other machine tools, is in many cases impracticable, and though such belts are strictly mill-gearing little danger arises where metal fastenings are avoided and efficient strap-forks are provided. Periodical examination of belts would lessen the number of breakages. Belt accidents would also be reduced either by prohibiting the use of projecting metal fasteners, or by requiring all belts with such fastenings to be fenced. There is, however, always risk of accident arising from contact at the intake between belt and pulley on contact with running belts, and fencing is necessary in the following circumstances: (1) All vertical and oblique belts (irrespectively of size and speed) passing through floors should be fenced round the openings by rails or casings of wood or metal to a height of at least 4 ft. Where belts are oblique it may also be necessary to fence the underside of the belt to a height of at least 6½ ft. so as to prevent accidental contact. (2) Horizontal and oblique belts used for main driving and counter-driving within 6½ ft. of the floor or other place to which the workers have access while the transmission machinery is in motion should be securely fenced by rails or casings so as to prevent accidental contact. (3) All overhead main driving belts, if more than 4 in. wide and moving with a velocity of more than 30 ft. per second, should be protected underneath with strong guards of wood or metal at those parts where persons are liable to pass under them. The protection under heavy overhead belts must be substantial, e.g., troughs of wood, sheet metal, perforated or expanded metal, strongly constructed and firmly supported by the walls or beams. Ladder like guards made of angle irons fitted with metal rungs or strong bow-shaped iron cleats fixed at intervals are also efficient; the latter types will not interfere with the examination of the belt or of a rope, and have the advantage that the driving bands or ropes are always visible. Fencing of other driving belts, in addition to main driving and counter-driving belts, may be necessary according to position, size, speed, or special circumstances, but much judgment and experience are necessary; low belts near the floor level and high-speed belts in saw mills, flour mills, and similar works should in general be guarded, but each individual case must be considered on its merits as to the degree of danger and the nature of the fencing requisite under the circumstances. In connection with the latter point minimum interference with manufacturing processes, efficiency as a guard, and access in case of repair or alteration have to be considered. Many belt fasteners are dangerous on account of metal projections, but of metal fasteners those consisting of continuous wire stitching held together by a peg other than a metal peg are safe. Belts with other forms of metal fasteners within reach of the workers should always be fenced. Loose ends must not be allowed on belts unless the belts are securely fenced. The fencing of driving ropes, except overhead ropes, should generally be on the same lines as the fencing of belts. There is not the same need for fencing small overhead driving ropes, as ropes never break without showing signs of wear and giving ample warning before breakage by the production of quantities of fluff, unlike belts, which generally break unexpectedly. Low sagging ropes above passage-ways in engine-houses, rope races, and workplaces should, however, always be protected by strong troughs or other efficient guards. Driving chains of metal, on account of their weight, are more dangerous than belts or ropes; the intake between a driving chain and pulley is as dangerous as the intake of toothed gearing. Chain belts should at least have a strong trough underneath, whatever their position, and if accessible they should be enclosed.

(*To be continued.*)

Preparing for Deeper Ships.

The Bombay Port Trust, through their consulting engineer and agents, Sir J. Wolfe Barry and Partners, have placed an order with Messrs. William Simons & Co., Ltd., of Renfrew, for a very powerful bucket dredger. The vessel is intended for a further improvement of the port of Bombay and its approaches, which has been rendered necessary by the demand of mercantile shipowners' for greater depth of water. As is well known, the cost of ocean transport per ton per mile is to a very large extent determined by carrying capacity. Consequently shipowners and shipbuilders have increased length and beam to the fullest extent possible within the limits of the depth of water in trading ports. They are not content, however, to be so confined in their enterprise, but, on the contrary, are clamouring for greater depths almost everywhere. One result of the demand for more water is that the Suez Canal Commission have decided to increase the depth of their waterway. That, in its turn, naturally involves the leading ports east of Suez, who will have to provide for the deeper ships it will soon be possible to navigate through the Canal. The dredger ordered for Bombay, which is to be capable of dredging to a depth of 50 feet, indicates that the Port Trust there are very much alive to their responsibilities in the matter. The vessel is to be built on the lines of the Corozal, which was turned out not long ago by Messrs. Simons for the Panama Canal. The Corozal has, by the way, been engaged recently dredging rock and hard clay, and the rock dredged had not been previously drilled or blasted.

The Carbide Lamp.

The danger of the carbide lamp as a source of accident is not wholly appreciated. While less likely to be the cause of an underground fire than is the candle, it is also capable of inflicting more or less serious accidents by itself. Thus, in the March *Safety First*, of the Nevada Consolidated, two minor accidents attributable to carbide are described. In one case, a man was changing carbide in his lamp after dark near an open light when the generated gas exploded and burned his face. In the other case, a quantity of spent carbide was emptied where a leak in a pipe line had made a puddle of water. A labourer threw a rail from his shoulder into the puddle and the mud of exhausted carbide, practically hydrate, was splashed in his face and injured his eyes severely.

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Stock Exchange Values.

According to the usual compilation in the current issue of the *Bankers' Magazine*, the aggregate value of 387 representative Stock Exchange securities on the 20th ult. showed only a comparatively small decline from the total value on the 20th March, but, of course, this does not take into consideration the fall which has taken place in the last few days, largely as the result of the action of the United States against Mexico. On the 20th the aggregate value showed a decline for the month of £1,649,000, or 0·05 per cent. The movements on the month were irregular, and while high-class investment stocks in some cases were favourably affected by monetary conditions, more speculative descriptions were adversely influenced by home and foreign politics. British and Indian Funds showed a rise on the month of nearly 1 per cent. and Corporation stocks were nearly 1½ per cent. higher, while Home Railway Debentures and Indian Railway stocks, recorded a small improvement. Home Railway Ordinary stocks, however, showed a drop of 0·8 per cent., American Rails a fall of 1·6 per cent. and Railways in British Possessions a loss of 3·3 per cent. Bank shares were firmer, but Insurance shares showed a slight reaction. In mining shares there was some improvement, fifteen representative South Africans recording an average advance of 4·4 per cent.

* * * *

The Rand Water Board New Scheme.

The Chief Engineer of the Rand Water Board, Mr. W. Ingham, is a believer in departmental work as against contract. He recommends that all big work in connection with the Vaal River scheme should be done departmentally, and in regard to the construction of the barrage he states that work of this kind is very difficult to let by contract owing to the fact that it impossible to state the depth at which the rock foundations will be found absolutely satisfactory. For work of this description a sum of money has to be allowed by the contractor above his usual profit (which would be about 15 per cent.) for the risk he must take of the river causing damage to his work during construction; and he receives this additional money whether the trouble occurs or not, whereas if it is carried out departmentally the Board would only pay for the damage if actually sustained. In regard to the concrete, only the very best work can be accepted for work of this nature, and there is always some danger of inferior material being put in, however carefully it is supervised, when carried out under contract, and the Board, he says, cannot afford to take the risk of inferior work in a case of this kind. Mr. Ingham states that he has constructed departmentally no fewer than five dams of various kinds as cheaply as a contractor could carry out such work. The saving in the case of the barrage, if carried out departmentally, would be at least £12,000. Plans for work of this nature would have to be prepared as the work proceeds, and this presents plenty of opportunity for litigation and compensation if carried out by contract. As he desires to avoid trouble of this nature in future, he strongly recommends the Board to carry out departmentally the laying and jointing of the pipes, and the erection of the telephone and transmission lines. He has no hesitation in saying that the barrage will be completed in a more efficient and cheaper manner and in shorter time if carried out departmentally. The whole of the machinery will be supplied and erected by overseas contractors who make this class of work a speciality, and they will take the responsibility of the gates working in an efficient and satisfactory manner.

* * * *

Union Statistics.

In June, 1912, it was decided to maintain the Census Office as a permanent office, which, in addition to arranging for the quinquennial census of population, was to compile statistics relating to all departments of the Public Service for publication in an annual blue book, the actual collection of the various statistics being undertaken by the respective Ministerial departments. It having been suggested in September, 1912, that the collection of agricultural statistics should be carried out by the Census Office, the Director, who was proceeding to England on leave of absence, was requested to visit the International Institute of Agriculture at Rome and the Statistical Bureaux at Washington and Ottawa to collect information as to the requirements of the institute, and as to the methods adopted in the United States of America and in Canada for the collection of agricultural statistics. On his return to Pretoria in June, 1913, the Director submitted a report, and in September it was decided that his office should be charged with the duty of collecting all agricultural statistics, including crop forecasts. At the same time it was also decided that the same office should undertake the collection of annual returns relating to industries throughout the Union. In the absence of powers to require persons to furnish information, except in connection with a general census, the collection of these agricultural and industrial statistics has had to be deferred until the Legislature gives the necessary powers. A Bill providing for this has been drafted. In the meantime, measures proposed to be taken to secure the required statistics are being considered, so that as soon as Parliament grants the necessary authority the collection of the statistics can be proceeded with. The Statistical Year Book for 1912 is being prepared, and (says the Secretary for the Interior) will, it is hoped, soon be ready for issue. While some departments have forwarded their returns promptly to the Census Office, the Director reports that others have experienced considerable difficulty in preparing the returns asked for, and the completion of the compilation of the Year Book has been delayed.

Rhodesian Gold Output.

The gold output for April eclipses all previous records, being 70,337 ozs., value £295,907, compared with 64,893 ozs., value £273,237 in March, the increase being 5,444 ozs., value £22,670. For the first time in the history of the industry, Mashonaland takes the first place with 36,523 ozs., value £153,852, as against 33,813 ozs., value £142,055, from Matabeleland. The increase is mainly due to the outputs from the Shamva and Cam and Motor.

Trade with Rhodesia.

The report of the Collector of Customs for Southern Rhodesia comprises a variety of statistical information of interest to those concerned in the development of the northern territory, or who have commercial transactions therewith. The gross total of the imports for 1913 was £3,018,204, of which ordinary merchandise for sale or consumption—*i.e.*, excluding railway and tramway material, Government imports and specie—amounted to £2,640,455, an increase over the previous year of £192,611, or 7·86 per cent., and over the average of the five years to 1912 by £519,828, or 24·51 per cent. It is noteworthy that for the first time the value of ordinary merchandise imported by the eastern route exceeded that imported by the southern, the difference in favour of Beira being slightly over 10 per cent. The value of South African produce and manufactures imported into the territory during the year was £542,830. This was a decline of £49,368 as compared with the previous year, up to which period there had been a progressive increase for a number of years past. Of the imports generally, the chief increases for the year were in plant and material for farming and mining, and more particularly in agricultural implements, fertilisers, and machinery. The decrease in the value of most "trade goods," as compared with 1911, which was noted in last year's report as a result of restricted purchases by natives consequent upon drought and failure of crops, is again apparent in the 1913 returns. A steady increase in the imports of such articles as farm implements, manures and sheep dip has been recorded for several years. A special feature of the year under review was the increased value of imports of corn and grain, etc., which was £87,864 in excess of the annual average for the previous seven years. The local shortage of maize, attributable to the partial failure of crops, accounts for this. On the other hand, an increase of £15,437 over the annual average for the seven years in respect of wheaten flour and meal, as well as increases in coffee and tea, may be regarded as indicating the growth in the population of the territory. The percentage of duty collected in relation to the value of total imports for consumption in the territory has for some years past been steadily falling off. Whereas the average at the close of 1905 was 13·91, for 1913 it was only 9·62 per cent., representing a loss of 4·29 per cent., or £120,000 per annum. The principal reason for this shortfall is the increased importation of certain articles of South African manufacture, free of duty, and the relative decrease of similar dutiable articles from oversea. Turning to the exports, which showed a total of the country's products of £3,297,099, it is interesting to note that raw gold accounted for £2,887,201, reflecting a continued steady increase, other increasing exports being those of tobacco, hides and skins and wool. For diamonds the figure was £4,328, as against £2,051 in 1912, £1,034 in 1911, and £2,114 in 1910.

Modderfontein B.

The Modderfontein B in the quarter ended March 31 earned a profit of £104,985. Development work resulted as follows:—Number of feet driven, sunk and risen, exclusive of stopes, 2,752 feet. Main Reef: Distance exposed, 2,034 feet; width, 15 inches; assay value, 72s 8d. Ore received from mine, 105,380 tons; ore received from surface dumps, 4,640 tons; waste sorted out, 9·4 per cent.; tonnage crushed, [illegible], number of stamps operating, 80; number of tube mills operating, 5; mill yield per ton, 20s.; assay value of pulp, 18s. 2d.; total yield, [illegible] ozs. fine, total yield per ton, 36s. 6d. With the exception of slight disorganisation caused by the strike in January, when the mine was successfully handled by the staff, the results for the quarter show little change from the preceding period. Towards the middle of the quarter the labour position improved, and since the middle of February it no longer became necessary to supplement the ore supply from the surface dumps, which will be held in reserve. The yield has shown a reduction of 1s. a ton milled, but working costs have been improved, so that the profit realised has shown little change. The foundation for [illegible] together with two sand tanks, have been completed, and generally new construction work is in a forward condition. Development has been of a normal character. The capital expenditure for the quarter was £5,360, mainly on account of additions to reduction plant and a new electric winding engine. The balance of authorised capital votes yet to be spent is £37,203. On Mr. E. H. Clifford's resignation as manager, Mr. C. L. Butlin was appointed to that position. The fifth ordinary general meeting of shareholders will be held in the board-room, The Corner House, Johannesburg, on Tuesday, 2nd June, 1914, at 12.15 p.m.

Permitted Explosives (for Use in Fiery Mines and Dry and Dusty Collieries.)

The Minister of Mines and Industries, under the powers vested in him by Regulation No. 98 of the Mines, Works, and Machinery Regulations published under Government Notice No. 1922 of 1911, has prohibited the use of certain "Permitted Explosives" specified in the First Schedule to the Regulations, and has permitted the use of certain other explosives not on the schedule, the following Amended Schedule of "Permitted Explosives," which have, in accordance with Chapter XIV. (5) of the Explosives Regulations, passed the necessary tests, is published for general information, and will supersede the First Schedule to the Mines, Works, and Machinery Regulations, 1911, as from the 16th day of June, 1914.

AMENDED SCHEDULE OF "PERMITTED EXPLOSIVES."

	Charge Limit. Ounces.	*Electric Detonator.*	*Swing of Pendulum, in inches.*
Apex Powder	12	6	2·69
Ammonite, No. 2	10	6	1·99
Ammonite, No. 3	12	6	2·12
Bellite, No. 2	32	7	2·42
Bellite, No. 4	18	7	2·92
Britonite, No. 2	24	6	2·26
Cambrite	30	6	1·98
Dreadnought Powder	32	7	2·05
Dynobel	22	6	2·61
Essex Powder	38	6	2·17
Expedite	32	7	2·62
Faversham Powder, No. 2	24	7	2·61
Haylite, No. 1	10	6	2·18
Kent Powder	32	6	2·01
Kentite	18	6	2·64
Kynarkite	20	6	2·21
Melling Powder	12	6	2·62
Monarkite	26	6	2·67
Monobel, No. 1	10	6	2·81
Negro Powder, No. 2	20	7	2·21
Neonal	16	6	2·56
New Fortex	10	6	2·61
Nitrodensite	28	6	1·47
Permon Powder	18	6	2·57
Pitite, No. 2	32	6	2·15
Pitsea Powder, No. 2	8	6	2·64
Sheppey Powder, No. 2	10	6	2·10
Stanford Powder	12	6	2·12
Sunderite	16	7	2·66
Super Excellite	10	7	2·74
Superite	10	7	2·53
Super Kolax	30	6	2·10
Swale Powder	20	6	2·50
Syndite	40	7	2·22
Tutol, No. 2	22	6	2·11
Uplees Powder	16	7	2·64
Westfalite, No. 3	12	6	2·55
Bobbinite, I. and II.	Electric fuse.		

Note.—Column 1 gives the maximum weight that may be fired in any one hole. Column 2 gives the minimum strength electric detonator with which shot may be fired. Column 3 gives the swing of the ballistic pendulum obtained with 4 oz. of the explosive named, where 4 oz. of gelignite (60 per cent. nitro-glycerine) gave 3·27 From this an estimate of the relative strength of the explosives can be made. Fur further particulars inquiries should be addressed to the Chief Inspector of Explosives, P.O. Box 4570, Johannesburg.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

WANTED—PARTNER

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Apply, J. G. WALTER,
Golden Valley, Rhodesia.

THE WEEK IN THE SHAREMARKET.

Stagnant—Waiting on Dividends—A Holiday Week.

THE market remains in a stagnant condition, little business, apart from that in one or two stocks, being done. The speeches made by Chairman at Rand mining company meetings this week were of a uniformly hopeful nature, but they have not yet had any effect on the market. Modder Deeps, on support from oversea, were the feature of the week; and the two favourite Barnato stocks, Van Ryn Deeps and Consolidated Langlaagtes, were also in some demand. The fluctuations in tin and diamonds at lower levels were few and unimportant. Prospects of the next few weeks are bound up with the dividends to be declared in the middle of June.

* * * *

	Fri., 22nd.	Sat., 23rd.	Mon., 25th.	Tues., 26th.	Wed., 27th.	Thurs., 28th.
Adair-Ushers	0 5*	0 5*	—	0 5*	—	0 5*
African Farms	11 6*	11 4*	—	11 3*	10 6*	10 9
Apex Mines	16 6*	16 3*	—	15 0*	17 6†	17 0*
Aurora Wests	—	—	—	—	8 0*	—
Bantjes Consolidated	—	13 3*	—	13 3*	13 0*	—
Brakpan Mines	—	39 0*	—	—	43 6*	44 0†
Breyten Collieries	—	27 0*	—	26 6*	26 6*	26 6*
Bushveld Tins	—	0 6*	—	0 6*	0 6*	—
Cassel Coals	—	—	—	15 0*	15 0*	15 0*
City and Suburbans	49 0*	49 0*	—	49 0	48 6*	48 9*
City Deeps	65 0*	65 0*	—	65 0*	65 0	64 9*
Cloverfield Mines	4 3	—	—	4 4†	3 11*	4 0*
Clydesdale Collieries	9 6*	—	—	—	—	—
Cons. Langlaagtes	33 3*	33 0*	—	33 6	33 0*	33 0*
Cons. Main Reefs	17 3†	17 0*	—	17 0	17 3	17 0*
Coronation Collieries	—	—	—	—	20 0†	—
Coronation Freeholds	0 4*	0 4*	—	0 4*	0 4*	0 4*
Crown Diamonds	—	5 0*	—	5 0*	5 0*	4 9*
Crown Mines	—	—	—	—	115 0*	—
Crown Mines Debs.	£98*	—	—	—	£98†	—
Durban Roodepoorts	—	—	—	21 6*	22 0*	22 0*
Durban Rood. Deeps	17 6†	—	—	—	—	—
East Rand Centrals	—	1 7*	—	1 0*	1 9*	1 9*
East Rand Coals	1 6*	1 6*	—	1 6*	1 6*	1 7*
East Rand Deeps	—	1 3*	—	1 5*	1 5*	1 5*
East Rand Props.	34 6†	33 0*	—	31 6*	—	32 0*
East Rand Debentures	£87*	£87*	—	£87½*	—	£87½*
Eastern Gold Mines	—	1 0*	—	—	1 0*	1 0*
Frank Smith Diamonds	3 6	3 5	—	3 4	3 3*	3 4*
Geduld Props.	—	23 9	—	23 3*	23 3*	23 0*
Geldenhuis Deeps	—	—	—	25 0†	—	—
Glencoe Collieries	6 3*	—	—	6 0*	6 6*	6 0*
Glynn's Lydenburgs	10 0*	10 0*	—	10 0*	10 0*	—
Government Areas	20 0*	20 0*	—	20 0	19 9*	19 9
Jhb. Board of Executors	23 9†	23 9†	—	23 9†	23 9†	23 9†
Jumpers	—	—	—	4 0†	4 0†	4 0†
Jupiters	—	—	—	—	—	4 3*
Kaalfontein Diamonds	0 3*	0 3*	—	0 3*	0 3*	0 3*
Klerksdorp Props.	2 5*	2 5	—	2 5*	2 5*	2 5*
Knight Centrals	8 6	7 8	—	7 6	7 9*	7 11
Knights Deeps	33 9*	—	—	—	—	—
Lace Props.	3 1*	3 1*	—	3 0*	3 3	3 1*
Langlaagte Estates	17 6*	17 6*	—	18 0*	19 0*	18 0*
Luipaardsvlei Estates	9 6*	9 6*	—	9 6*	9 6*	9 6*
Lydenburg Farms	—	—	—	—	2 6*	—
Main Reef Wests	5 9	5 6*	—	5 6*	5 6*	5 9*
Meyer and Charltons	—	—	—	110 0*	110 0*	111 3*
Middelvlei Estates	—	1 0*	—	1 0*	1 1*	1 1*
Modderfontein B.	83 0*	83 0*	—	83 0*	83 6*	84 0*
Modderfontein Deeps	49 6	48 3*	—	48 9	48 3*	48 3
Natal Navigation Colls.	15 0*	—	—	—	15 0*	—
New Boksburgs	0 8*	0 9†	—	0 9	0 9*	0 9*
New Eland Diamonds	—	—	—	—	28 0†	—
New Era Cons.	5 9†	5 9†	—	—	5 0*	5 6*
New Geduld Deeps	—	1 9*	—	—	1 9*	—
New Gochs	14 0*	—	—	—	—	—
New Heriots	—	—	—	61 3†	—	—
New Kleinfonteins	22 6	22 0*	—	22 6	22 0*	22 0*
New Modderfonteins	250 0*	250 0*	—	250 0*	250 0*	252 6*
New Rietfonteins	3 0	3 0	—	—	—	—
Nourse Mines	—	—	—	—	23 0*	—
Orange Diamonds	1 3†	1 0*	—	1 0*	1 0*	1 0*
Piggs Peak	—	9 9*	—	9 9*	9 9*	9 9*
Pretoria Cements	45 0*	45 0*	—	45 6*	45 6*	45 6*
Princess Estates	—	4 9*	—	4 9*	4 9*	—
Rand Klips	2 3*	2 4*	—	2 4*	2 4*	2 4*
Rand Nucleus	1 7*	1 8	—	1 7*	1 8*	1 7*
Randfontein Deeps	3 6*	3 8*	—	3 7*	3 7*	3 7
Randfontein Estates	—	20 6*	—	20 6*	19 9*	20 3*

*Buyers. †Sellers.

	Fri., 22nd.	Sat., 23rd.	Mon., 25th.	Tues., 26th.	Wed., 27th.	Thurs., 28th.
Roberts Victors	15 0*	15 0*	—	15 0*	15 0*	15 0*
Robinson Deeps	—	—	—	30 0†	—	—
Rooiberg Minerals	21 9	21 0*	—	21 3	21 3*	21 3*
Ryan Nigels	2 6*	2 6*	—	2 6*	—	2 6*
Shebas	4 6*	—	—	—	4 6*	4 6*
S.A. Breweries	39 3*	—	—	39 0*	—	39 6*
S.A. Lands	2 6*	2 6	—	2 6	—	2 6*
Springs Mines	12 0†	10 6*	—	11 9†	10 9	11 3†
Sub Nigels	10 6*	10 6	—	10 3*	10 0*	10 3*
Transvaal Coal Trust	—	26 0*	—	26 3	26 6*	26 6*
Van Ryn Deeps	44 9*	44 9	—	44 9*	44 9*	45 0*
Village Deeps	39 0†	—	—	—	—	37 0*
Vogel. Cons. Deeps	—	1 0†	—	—	—	—
West Rand Cons.	—	—	—	—	8 0*	8 0*
Western Rand Estates	—	—	—	2 0	2 6†	2 0*
Witwatersrands	68 9*	68 9*	—	68 9*	68 9*	68 9*
Witwatersrand Deeps	52 0*	52 0*	—	52 0*	52 9†	51 6*
Wolhuters	13 9*	13 9	—	13 3*	13 6	13 6
Zaaiplaats Tins	25 0*	25 0*	—	25 0*	25 0*	25 0*

*Buyers. †Sellers.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

June 2.—Modder. B.; Bantjes (annual).
June 3.—Crown Mines; Durban Roodepoort Deep; Village Deep (annual).
June 17.—S.A. Gold Mines; Leeuwpoort Tins; African Farms.
June 22.—Robinson Deep (annual).
June 23.—Transvaal Consolidated Lands (annual).
June 26.—General Mining and Finance Corporation (Annual).
June 30.—A. Goerz & Co., Ltd. (annual); Robinson G.M. (annual).
Sept. 18.—Transvaal G.M. Estates (annual).

Northern Transvaal Lands.

The directors of the Northern Transvaal Lands Company, of which Mr. Edward W. Cox-More is the chairman, submit the accounts for the year ended December 31, 1913. The capital account is the same as last year, viz., 176,405 shares of 5s. each fully paid, or £44,101. The revenue earned for the year in South Africa has exceeded in a slight degree that of any previous year. The net profit is £1,325, leaving a debit balance at profit and loss account of £1,700. After deducting the farm sold since last account, the area completely owned by the company is 271,234 acres; in addition to which it retains the mineral rights over four farms, having an area of 20,009 acres. The sale of farm Zoetfontein during the year resulted in a net profit of £919. Other offers have been submitted to the board, but the prices were deemed inadequate. The revenue from native tenants is being maintained, and a slight improvement has been shown in the leases to white farmers. The opening up of the Cyferfontein lime deposit by an incline shaft on the reef to a depth of 150 feet has disclosed the width of the reef to from 4 ft. of the surface to be 3 ft., when it rapidly widens out within the next 3 or 4 ft., and attains a constant width of between 9 and 10 ft. At Voorburg prospecting operations have been carried out by shaft sinking on the coal outcrops, and four coal seams have been located. The first seam is not of much importance; the second seam is 20 in. thick; the third seam is 21 in. thick; and the fourth seam is 12 in. thick. The latter seams are separated by 2 ft. of shale, and the coal is of good quality, and quite suitable for smelting and steaming purposes. These two seams can be worked together, the shale being sorted out and used for packing, leaving fully 30 in. of good coal for economical purposes. The coal measures cover a large area of the farm, and doubtless the seams exposed will be found to be of variable thickness within this area, and probably of greater thickness to the south and west. Having regard to the satisfactory nature of these operations, it has been thought well to concentrate efforts in this direction. Consequently development on the other farms belonging to the Northern Minerals (Transvaal), Ltd., have been suspended for the present. Revenue is, however, being derived from European and native tenants on all of these properties.

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

QUARTERLY REPORTS.

Rose Deep.

The quarterly report of the Rose Deep for the period ended March 31 shows a profit of £67,137. Development work resulted as follows:—Number of feet driven, sunk and risen, exclusive of stopes, 1,775 feet. Main Reef: Distance exposed, 663 feet; width, 35 inches; assay value, 32s. 4d. Main Reef Leader: Distance exposed, 546 feet; width, 22 inches; assay value, 21s. Main Reef Leader and South Reef Leader: Distance exposed, 150 feet; width, 34 inches; assay value, 37s. South Reef: Distance exposed, 145 feet; width, 33 inches; assay value, 31s. 1d. Ore received from mine, 222,801 tons; waste sorted out, 13·4 per cent.; tonnage crushed, 192,700; number of stamps operating, 300; number of tube mills operating, 7; mill yield per ton, 15s. 3d.; assay value of pulp, 10s. 4d.; total yield, 54,889 ozs. fine; total yield per ton, 23s. 11d. The conversion of No. 1 shaft to two-stage winding has progressed satisfactorily, and the excavation for the main ore bin was completed during the quarter. As the result of an improvement in the labour supply, the tonnage crushed increased by 10,200 tons as compared with the previous quarter, and the plants are now running at their full capacity. The profit was £8,307 lower, on account of a decrease in the yield of 1s. per ton, coupled with a small increase in the working costs. A sum of £109 was expended on capital account, leaving an amount of £2,477 to be spent on authorised work. On the resignation of Mr. B. Madew as consulting engineer, Mr. E. H. Clifford was appointed to that position. The eighteenth ordinary general meeting of shareholders will be held in the board-room, The Corner House, Johannesburg, on Friday, 5th June, 1914, at 10.45 a.m.

New Modderfontein.

For the quarter ended March 31, 1914, the New Modderfontein earned a profit of £148,631. Development work resulted as follows:—Main Reef: Distance exposed, 2,573 feet; width, 13 inches; assay value, 193s. 7d. Main Reef Leader: Distance exposed, 39 feet; width, 4 inches; assay value, 404s. Ore received from mine, 137,534 tons; waste sorted out, 3 per cent.; tonnage crushed, 131,700; number of stamps operating, 180; number of tube mills operating, 7; mill yield per ton, 28s. 2d.; assay value of pulp, 12s. 7d.; total yield, 60,122 ozs. fine; total yield per ton, 38s. 5d. Partly owing to a small increase in the native force, but more to the completion of various arrangements for handling ore underground, it has been possible to gradually increase the quantity of ore milled during the quarter. The yield was somewhat lower, but working costs continued to decrease, with the result that the profit showed a marked advance. The mine is now in full swing and working to advantage, and can continue to do so as long as the moderate labour supply now in its possession can be maintained. A sufficient quantity of development work has been carried out with good results; at the circular shaft generally profitable reef disclosures are being made. The foundations for winding engines, compressors and the general permanent equipment at the circular shaft are well in hand. An amount of £24,708 was expended on capital account; the balance of working capital on hand is £88,565.

The Robinson.

The profit earned by the Robinson for the quarter ended March 31 was £147,781. Development work resulted as follows:—Main Reef: Distance exposed, 10 feet; width, 60 inches; assay value, 17s. Leader: Distance exposed, 490 feet; width, 43 inches; assay value, 71s. 2d. South Reef: Distance exposed, 120 feet; width, 33 inches; assay value, 52s. 6d. Ore received from mine, 141,048 tons; ore received from surface dumps, 17,683 tons; waste sorted out, 7·3 per cent.; tonnage crushed, 148,700; number of stamps operating, 250; number of tube mills operating, 6; mill yield per ton, 24s. 5d.; assay value of pulp, 11s. 1d.; total yield, 60,690 ozs. fine; total yield per ton, 34s. 4d.; accumulated slimes, tonnage treated, 4,235 tons; accumulated slimes, yield, 602 ozs. fine. The exposures on both Leader and South Reef are again very satisfactory. The acute shortage of native labour brought about by the loss of nearly all the tropical natives seriously affected the tonnage and profits. Sand-filling operations were continued, and 33,302 tons were lowered into the lower levels at No. 2 shaft. The twenty-fourth ordinary general meeting of shareholders will be held in the board-room, The Corner House, Johannesburg, on Tuesday, the 30th day of June, 1914, at 11 a.m.

Nourse Mines.

In the quarter ended March 31 the Nourse Mines earned a profit of £36,652. Development work resulted as follows:—Number of feet driven, sunk and risen, exclusive of stopes, 3,840 ft. Main Reef: Distance exposed, 540 feet; width, 43 inches; assay value, 24s. 9d. Main Reef Leader: Distance exposed, 610 feet; width, 11 inches; assay value, 89s. 6d. South Reef: Distance exposed, 650 feet; width, 25 inches; assay value, 64s. 8d. Ore received from mine, 143,030 tons; waste sorted out, 14·9 per cent.; tonnage crushed, 122,000 tons; number of stamps operating, 260; number of tube mills operating, 7; mill yield per ton, 20s. 5d.; assay value of pulp, 8s. 6d.; total yield, 40,600 ozs. fine; total yield per ton, 27s. 11d. The continued shortage in the native labour force is again reflected in the results for the quarter and the tonnage milled is far below the capacity of the plant. The working profit was therefore some £8,000 less than in the December quarter. Development operations have been well maintained, with satisfactory reef disclosures. Towards the end of the quarter under review several underground alterations have been completed, and it has been possible to close down one haulage shaft. At the same time the east incline has been converted into an ore pass, and better use can now be made of the 20th level mechanical haulage road which was recently completed. The small sum of £116 was spent on construction account, leaving an amount of £4,300 still to be expended on authorised votes. Mr. H. Stuart Martin has been appointed consulting engineer of the company, in place of Mr. B. Madew, resigned.

Randfontein Central.

Report for quarter ended March 31. Revenue, £653,735 5s., or £1 3s. 10d. per ton, from 546,753 tons milled; cost, £483,517 16s. 11d., or 17s. 8d. per ton; profit, £170,217 8s. 11d., or 6s. 2d. per ton; yield—mill 79,850 ozs., cyanide 75,978 ozs.; total yield, 155,828 ozs.; capital expenditure, £66,531; development, 106,519 cubic feet; ore reserves, 8,661,621 tons. The machinery and plant are in good order. The water supply is sufficient. Although the native labour position improved towards the end of the quarter, the mine is still short of requirements. The general strike in January caused a 3½ days' stoppage of the mills and subsequent disorganisation. In terms of the trust deed, £81,600 of debentures have been purchased at par in satisfaction of the obligation to redeem that amount on March 1, 1914.

Langlaagte Estate.

Report for quarter ended March 31. Revenue, £168,572 9s. 6d., or £1 4s. 2d. per ton, from 139,273 tons milled; cost, £128,095 13s. 6d., or 18s. 4d. per ton;. profit, £40,476 16s., or 5s. 9d. per ton; yield—mill 19,192 ozs., cyanide 20,686 ozs.; total yield, £39,879 ozs.; capital expenditure, £4,069 19s.; development, 3,108 linear and 4,000 cubic feet; ore reserves, 1,526,285 tons. The machinery and plant are in good order. The water supply is sufficient. Although the native labour position improved towards the end of the quarter, the mine is still short of requirements. The general strike in January caused a 2½ days' stoppage of the mill and subsequent disorganisation.

New Companies.

Below is the list of new companies registered during the month of April:—

Coll Lewis & Co., Ltd., 16 Sauer Street, Johannesburg; capital £500.
Capital Trading Co., Ltd., 10 Bureau Street, Pretoria; capital £2,000.
Lewis & Co., Ltd., Ryan's Buildings, corner of Marshall and Macintyre Streets, Jeppestown; capital £15,000.
The Skepko (South Africa) Ball-Bearing Co., Ltd., 23 Pritchard Street, Johannesburg; capital £10,000.
Press Cuttings, Ltd., 18 Permanent Buildings, Harrison Street, Johannesburg; capital £1,000.
Craigie Mines, Ltd., 22 Corporation Buildings, Commissioner Street, Johannesburg; capital £12,500.
Occult and Psychotherapeutic Society, Ltd., 13 Henwood's Arcade, President Street, Johannesburg; capital £200.
Vaal River Salt Works, Ltd., Exploration Buildings, Fox Street, Johannesburg; capital £3,500.
Spiros Pharmacy, Ltd., Meischke's Buildings, Harrison Street, Johannesburg; capital £800.
The Sabie Assembly Hall, Ltd., Farm Grootfontein No. 1327, District Lydenburg (Sabie); capital £500.
The South African Co-operative Creameries Agency, Ltd., corner of Fraser and Pritchard Streets, Johannesburg; capital £1,200.
Rand Bottlers' Co., Ltd., Post Office Buildings, corner of Rissik and Market Streets, Johannesburg; capital £1,500.
The Goldfields Garage, Ltd., 58 Anderson Street, Johannesburg; capital £3,500.
The Premier Co-operative Association of South Africa, Ltd., 11-17 Trust Buildings, Fox Street, Johannesburg; capital £1,000.
South African Tanning Co., Ltd., 33 Moseley Buildings, President Street, Johannesburg; capital £5,000.
A. M. Mostert, Ltd., Leake's Buildings, 5 Harrison Street, Johannesburg; capital £10,000.
Save-All, Ltd., corner of Marshall and Nugget Streets, Johannesburg; capital £250.
Magdala Developing Co. (Northern Transvaal), Ltd., 26 Steytler's Buildings, Market Square, Johannesburg; capital £2,400.
Riordan, Sheir & Co., Ltd., 29 Robinson Buildings, Commissioner Street, Johannesburg; capital £500.
The South African Farmers' Guide and Industrial Gazette, Ltd., 11-12 Steytler's Buildings, Market Square, Johannesburg; capital £10,000.
E. Kallenbach, Ltd., 44 and 45 Sacke's Buildings, Joubert Street, Johannesburg; capital £1,000.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—Lewis Waller Co.	8.15
Standard—Rayne-Paumier Company	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

The Week's Company Meetings.

WITWATERSRAND DEEP.

The Water Difficulty.

Brighter Outlook.

The sixteenth ordinary general meeting of the shareholders in the Witwatersrand Deep, Ltd., was held on May 15. in the board-room, Cullinan Buildings. Mr. W. H. Dawe was in the chair, and among those present were Messrs. W. Boness, R. A. C. Carnes, H. W. Anderson, R. Niven, E. Rothschild, W. T. Graham, A. G. Gill, W. H. B. Frank, P. J. Murphy, E. Callens, M. Honnet, E. M. Hyman, M. Dold, J. H. Ryan, and H. G. L. Panchaud, secretary—representing 47,544 shares out of 550,000.

Chairman's Speech.

In moving the adoption of the report and accounts, the Chairman said: The information regarding results of operations for the year ended the 31st of December last, which is embodied in the reports and financial statements, is of a more satisfactory nature than that submitted to you for the past few years, inasmuch as it shows increased profits resultant from the fact that the water trouble, which has caused us so much anxiety, has been gradually decreasing, till now it may be said to have disappeared, so far as it affects the mining operations. Since December, 1912, the influx of water has decreased from 1,925,000 gallons per diem to about 300,000 gallons, and this amount is practically limited to the 18th crosscut near the east shaft, where pumping facilities are considerably in excess of the requirements. The position, therefore, is that instead of being able to supply water to neighbouring companies, the amount which is now being pumped is all utilised for your company's needs. The water trouble lasted for a considerable period, and was the cause of great anxiety and expense; the latter was minimised to the greatest extent possible by disposing of the surplus water, thus reducing pumping charges, and recently it has been possible to dispose of a considerable quantity of the pumping plant, which is no longer necessary. In connection with the results of the year's working, the total profit of £303,238 represents an increase of £98,221 on the figures of the previous year; the tonnage milled also shows an increase of 67,230 tons, and the profit per ton milled was 2s. 7.3d. per ton higher. I think one of the most satisfactory features was the reduction of working costs to 17s. 3.1d. per ton—that is, 1s. 7.6d. per ton less than the average for the year ended the 31st of December, 1912; the actual improvement was even greater than these figures imply, as during the last five months of the year the average cost per ton milled was 16s. 1.3d.

Credit Balance, £111,565.

The financial items are summarised in the directors' report, and consequently it is unnecessary for me to deal with them again in detail. It is sufficient to point out that the credit balance of £66,992 brought forward at the beginning of the financial year had increased to £111,565, after the declaration of dividends fifteen and sixteen of 15 per cent. and 20 per cent. respectively. The credit balance was increased more than it would otherwise have been in order to provide for the purchase of a portion of the block of claims acquired from the New Transvaal Chemical Co., Ltd., in which the Witwatersrand Gold Mining Co., Ltd., participates. The purchase price for the whole block of claims amounted to £42,828, therefore if we take one-half of this amount as being the purchase price of the claims which your company will retain, it is evident that the financial position of your company, at the end of 1913, was much stronger than it was at the end of 1912, though even at that date it was very satisfactory. You will notice that the amount of £7,860 was absorbed by the redemption of debentures, thus reducing the outstanding debentures to the almost nominal figure of £24,340. The chief items of capital expenditure—in fact, the only items of note if we except the expenditure on the purchase of claims—were shaft sinking, the cost of which was £23,942. and machinery and plant, amounting to £16,987, particulars of which are given in detail in the manager's report. Owing to the better position in regard to the water difficulty the facilities for development south of the water dyke were considerably increased, which is shown by the fact that the footage driven, raised and sunk was increased from 12,052 to 16,726 feet, a gain of 4,674 feet. The development south of the water dyke gave satisfactory values, the ore in sight east of the large western transverse break south of the water dyke amounting, at the 31st of December, to 485,000 tons, of an average assay value of 7.26 dwts. over a stoping width of 57.5 inches, and the consulting engineer points out that so far all the ore developed in this area has shown payable values. The result of being able to proceed with the development on more normal lines is reflected in the ore reserves, which, on the 31st of December last, amounted to 1,666,000 tons, of an average assay value of 6.8 dwts., being an increase of 173,700 tons on the reserves of the previous year, with practically the same average value.

Development Work.

In regard to the development work south of the water dyke for the first four months of the current year, that is, to the 30th of April, you will be interested to have the following information: 350 feet on the west drive of the 17th level gave an average value of 11.1 dwts. over a reef width of 60.3 inches; 190 feet on the west drive of the 17th level, south of the Driefontein dyke, gave 8.9 dwts. over a reef width of 28.8 inches; 100 feet on the 18th level west drive gave 7.4 dwts. over a reef width of 60.8 inches; and a further 90 feet on the same level averaged 4.1 dwts. over 35.2 inches; 190 feet on the 18th level east drive averaged 5.1 dwts. over 68.8 inches.

The payable tonnage developed during the first four months of this year was 142,775 tons, of an average value of 6.67 dwts. over 64in. The unpayable ore developed amounted to 7,172 tons only. You will have noticed with interest that the work of sand-filling has been carried on throughout the year, and, as your consulting engineer points out, the effect of the filling is to make the worked-out areas much safer and to reduce the pressure on the lower working of the mine, while it also admits of the extraction of ore from pillars in the old section of the property.

There is one question in connection with the current year's working which gives us cause for some anxiety, and that is the shortage in the complement of native labour. As you are aware, this company, as a result of its successful treatment of Central African natives, employed a large percentage of that class of labour Owing to the fact that recruiting in Central Africa has been prohibited, and that the contracts of many of these natives have been completed, it has been necessary to replace that class of labour with natives from other districts. This change has caused some disorganisation, and the supply of unskilled labour is below the requirements, though I am glad to be able to say that we are gradually making up the deficiency. Still, with the winter months so near at hand, there is a possibility that we shall not be able to obtain the full number required. It is true that the difficulty is but a temporary one: at the same time it unfortunately restricts the basis of operations, and has resulted, during the past few months, in the milling of a lower tonnage, with proportionately smaller profits, than would have been the case under normal conditions. To make this point clear I need only mention that whereas there were 4,199 natives employed on the 30th of April, 1913, we had 3,084 employed on the 30th of April, 1914.

White Labour.

There is another question I should like to refer to briefly, and that is in connection with white labour. As you are aware, the question of unemployment has been claiming a great deal of attention recently. So far as the miners are concerned, the position has in some quarters been ascribed to the strike which took place in January last, and it has been stated that it is the deliberate intention of the mining companies not to engage a large number of the men who are seeking employment. That is not the case, and as far as the large majority of those who are unemployed is concerned their position is the result of the shortage of native labour. On the 30th of April, 1913, the members of the Witwatersrand Native Labour Association had in their employ 230,103 natives, whereas on the 30th of April, 1914, this number was reduced to 188,780—that is a decrease of practically 18 per cent. It is impossible, in view of this difference, that the number of white men employed should not be affected, but that the number affected is less than might have been reasonably expected was clearly shown in the presidential address at the last annual meeting of the Chamber of Mines; as far as the Neumann Group of companies is concerned I am in the position to emphasise the point then made, for on the 30th of April, 1913, when the companies of this group had 14,086 natives in their employ, the ratio of natives to white employes was 8.39, whereas on the 30th of April, 1914, when there were 11,251 natives employed, the ratio of natives to white employes was 7.17. Though this question has been dealt with before, I think no apology is needed for making a further reference to it, because it is one of the most important factors in connection with the question of unemployment, and it is also a point which is generally entirely overlooked, perhaps intentionally.

During the past year Mr. S. C. Thomson, who was your company's consulting engineer for many years, resigned that position, as he decided to leave the country, and on behalf of the directors I should like to express their appreciation of the valuable services rendered by Mr. Thomson during the period he was connected with the company. On Mr. Thomson's retirement Mr. D. Wilkinson was appointed in his stead, and as this gentleman has had a lengthy experience of the Rand your board entrusted the duties of consulting engineer to him with the utmost confidence.

From the information which has been submitted to you I think you will endorse the opinion expressed by your consulting engineer as to the satisfactory outlook for your company, and we hope that the profits earned for the current year will be higher than those for the past year, but that, as I have already explained, is dependent on the labour supply.

I now beg to move the adoption of the reports and accounts, as submitted.

The report and accounts were adopted.

In reply to a question as to the life of the mine, the chairman said he had no information to add to that given last year, when details were given as to the claim area and the possible tonnage.

Messrs. W. H. Dawe and A. G. Gill, the retiring directors, were re-elected, as also were the auditors, Messrs. Thomas Douglas and H. J. Lamb.

NEW ERA CONSOLIDATED.

Investments Reviewed.

The twelfth ordinary general meeting of the New Era Consolidated, Ltd., was held in the board room of Corner House, on May 26, Mr. W. L. Honnold presiding. Among those present were Messrs. F. R. Lynch, G. Sonn, H. S. Fisher, W. McCullum, W. S. Saunders, A. S. Pearse, H. S. Johnson Hull, R. des Clayes, W. Ross and A. F. Lyall, for the secretaries.

The Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: As you are aware, the year 1913 was not favourable to companies operating in the Transvaal. The political situation abroad was such as to cause stringency in the European money markets, and, here on the Rand, we had an industrial upheaval which tended to divert the little capital which might otherwise have been available to countries where more peaceful conditions prevailed. So unfortunate a combination of circumstances could not but exert an adverse influence on the market value of shares, as well as on the operations of companies. Before asking you to adopt the reports and accounts I will, as usual, briefly refer to the position set forth in the financial statements. There has been no opportunity of profitably dealing with any of the company's claim holdings and your interests under this head, therefore, remain unchanged at 601 deep level claims. In regard to shareholdings, certain transactions have taken place. The South French Rand Company, in which we were interested, was placed in liquidation during the year, and other holdings have been disposed of. Arising out of the favourable outlook in the earlier part of the year your interest in the Transvaal Coal Trust Company was increased and a certain number of shares acquired in Swaziland Tin, Ltd. The total shareholdings of the company are represented in the accounts at a book value of £58,869 6s. 5d. In regard to our interests, I may point out that most of the concerns in which we now hold shares are dividend payers. It is also to be borne in mind that our cash and cash assets at the end of the year amounted to over £48,000, so we are in position to take advantage of any favourable opportunites which may arise for new business. Reference to the accounts in your hands will show that the profit for the year amounted to £15,968 17s. 9d. This sum was not only sufficient to meet all expenses and permit distribution of the usual 10 per cent. dividend, but also enabled the balance carried forward to be slightly increased as compared with last year. The annual general meetings of Brakpan Mines, Limited, Transvaal Coal Trust Company, Limited, and Springs Mines, Limited, in all of which companies you are largely interested, have been held this morning, and I refer you to the reports and accounts, as well as to my own remarks, for particulars as to their positions. You will note that, although Brakpan and Coal Trust have suffered to an exceptional degree through the adverse influences of the year, the present outlook is not without encouraging features.

The report and accounts were agreed to.

Company's Share Transactions.

Criticism was offered by shareholders to the selling of Van Ryn Deep and City Deep shares. One shareholder pointed out that the prospects of Van Ryn Deep and City Deep were never better, and the New Heriot shares were better now than ever. Was there any assurance that the company had £50,000 in hand, and, if so, would it not still be better to distribute the amount among shareholders? Further, would it not be better to abandon the mining claims, which were very deep, and for which the company was paying £1,000 a year in claim licences. Another shareholder complained that the company had sold its best shares and bought others in Coal Trusts, in which they had already a large holding. If 20,000 Brakpan shares had been sold, anybody could have understood such a transaction; but, instead, the best shares had been sold. Further, the company kept a consulting engineer and did no mining.

In reply, the Chairman stated that while the directors realised that certain of the transactions had proved unfortunate, still they had acted on the best information available at the time. In the light of subsequent happenings, their action might be open to criticism; but it was as impossible to foresee the future as it was easy to criticise after the event. Everyone who had attempted to do business on the share-market during the past year had experienced unprecedented difficulties. As regards the retention of the claim holdings, the claims now held had been carefully selected at the time of the reconstruction of the company as the most promising, and the board felt that they were justified in showing some confidence in the future of the industry by retaining the claims.

In reply to a further question, and also to the inquiry regarding the present cash position of the company, the Chairman stated that since the end of the year the board had purchased New Heriots at a lower price than they had sold at, and that they had this year purchased the following dividend-paying stocks: 1,000 City and Suburban G.M. Co., 1,000 Witwatersrand G.M. Co. (Knights), 500 New Modders, 500 New Heriots.

Messrs. C. H. Mullins, V.C., C.M.G., and Clement Davies were re-elected directors.

Messrs. A. E. Page and E. Broom were reappointed auditors.

The shareholders who offered criticism proposed and seconded a vote of thanks to Mr. Honnold for the courtesy of his replies, and expressed satisfaction at the share purchases announced by the Chairman.

SPRINGS MINES.

Progress of Development.

The fifth ordinary general meeting of Springs Mines, Ltd., was held on May 26 in the board-room of Corner House, Mr. W. L. Honnold presiding. Among those present were Messrs. C. Marx, F. R. Lynch, R. J. Frecheville, Messrs. Elkan, G. Sonn, V. J. Ronketti, W. H. B. Frank, A. S. Pearse, F. A. Unger, F. S. J. Hall, W. Ross and A. F. Lyall, for the secretaries. There were represented 334,570 shares out of an issued capital of 630,000.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: A company such as yours presents but little scope for the chairman's remarks at this period of its life, owing to development not being advanced sufficiently to afford a reliable index as to the nature of the mine. Full details of the work accomplished and the results obtained appear in the reports now in your hands, and I shall, therefore, merely direct your attention to the more salient features and bring your information up to date. The reef, as you know, was encountered in the north and south shafts during March and August respectively, and, though the values obtained were low, the showing was sufficiently encouraging to justify us in proceeding with the further opening of the property. The total development for the year amounted to 5,749 feet, of which 634 feet were on reef. At first glance these figures appear unsatisfactory because of the relatively small footage on reef. The consulting engineer's report, however, will have made it clear that the apparent discrepancy is due to the necessity of confining the earlier work mainly to haulages and station roadways below the reef. Of the total development, 2,700 feet were sampled and returned an average value of 8.5 dwts. over 32.7 inches. Here again the initial steps in the opening of the mine have resulted in ambiguous figures, for, whereas only 634 feet of the development were on reef, 2,700 were sampled. The explanation also lies in that most of the development has been below the reef and that sampling had therefore to be done by means of diamond drilling. It would have been possible to sample more than 2,700 feet in this manner, but as the roadways have been driven in close proximity to each other at certain points, further expenditure was considered unnecessary. Taking the shafts separately, we find that in the north shaft 3,903 feet of development had been accomplished at the end of the year, of which 1,775 feet showed an average assay value of 9.6 dwts. over 27 inches. At the south shaft the footage amounted to 1,846 feet, of which 925 feet were sampled, the average value being 7.3 dwts. over 43.5 inches. As previously stated, the total development in both shafts amounted to 5,749 feet, of which 2,700 feet were sampled, averaging 8.5 dwts. over 32.7 inches.

Total Development.

At the end of last month the total development had been increased to 11,393 feet, of which 6,055 feet had been sampled, averaging 11 dwts. over 23 inches. Of the footage sampled 2,855 feet, or 47 per cent., may tentatively be classed as payable, its average assay value being 16 dwts. over 28 inches. No estimate of tonnage has yet been made as development is not sufficiently advanced to permit of reliable calculations. It is of interest to note that recent development has shown material improvement, the average assay value in April having been 22 dwts. over 16 inches, 50 per cent. of the sampled footage being payable and averaging 32 dwts. over 20 inches. The permanent stations and station roadways have been completed and development, including the main incline and its southern extension, is being pushed forward with all possible speed. It has been considered advisable to either curtail or suspend work on the other haulage ways, as they are now well advanced and the opening of levels is of greater importance. Both shafts have been finally plumbed and the bearings of the main incline have been determined by Mr. F. G. A. Roberts, who was so successful in his survey of the connection between the shafts at Brakpan Mines. It is anticipated that the connection between the shafts will be completed in October. and it is hoped that before the available funds are exhausted sufficient development of satisfactory nature will have been accomplished to ensure the provision of further cash requirements.

Water Difficulty.

As you are aware, the quantity of water encountered in the overlying dolomite was responsible for the extraordinary expenditure on shaft-sinking and caused the management considerable trouble in the past. Though but little water has so far been met in the workings below, additional pumping plant has been installed capable of dealing with one million gallons per day from each shaft, since we have always to reckon on the possibility that, sooner or later, water-bearing fissures may be encountered. Every reasonable precaution in this connection has therefore been taken. The strike of mine workers in July last and that in January this year temporarily disorganised work at the mine and somewhat curtailed operations. Relatively speaking, however, your company suffered but little inconvenience and expense. As I informed you at the last annual general meeting, application was made to the Government for discoverer's rights and you will see from the directors' report that the application was granted and our claim area thus increased by 171.6 claims. The financial position is fully set forth in the balance sheet. At the end of the year under review the available cash amounted to £205,994, while the cash and cash assets, less liabilities, represented a total of £214,086. It is impossible to forecast the rate of expenditure with accuracy, but, in so far as can now be foreseen, it would seem that the funds in hand should carry us to the end of the first quarter of next year. In concluding my remarks, I wish to express our appreciation of the able services rendered by Mr. C. E. Knecht, the consulting engineer, and Mr. J. F. Cook, the consulting mechanical engineer. I also wish to tender to Mr. B. D. Bushell and the mine staff our thanks for their zealous and loyal services during an exceedingly trying year.

The report and accounts were adopted.

Messrs. W. H. Dawe and W. Dalrymple were re-elected to the directorate, and the appointment of Mr. H. Neuhaus as a director in place of Mr. M. G. Elkan, resigned, was confirmed.

Messrs. A. E. Page and F. W. Diamond were re-elected auditors.

TRANSVAAL COAL TRUST.

A Trying Year.

Improved Position.

The twenty-second ordinary general meeting of shareholders of the Transvaal Coal Trust, Ltd., was held in the boardroom, Corner House, on May 26, Mr. W. L. Honnold presiding. Among those present were Messrs. Charles Marx, G. Nathan, R. J. Frecheville, F. R. Lynch, G. Sonn, A. S. Pearse, M. G. Elkan, H. S. J. Hall and A. F. Lyall, for the secretaries.

Chairman's Remarks.

The Chairman, in moving the adoption of the report and accounts, said: Before formally moving the adoption of the report and accounts now in your hands I will, with your permission, and as briefly as possible, review the affairs of the company for the past year. The results of the prospecting operations which were being carried out in the Breyten district when we last met, and of some work subsequently undertaken in the Middelburg district, were not sufficiently encouraging to warrant the exercise of our options. It was considered advisable, therefore, to make certain further additions to the plant at Oogies, and thus enable that plant, in so far as possible, to deal with the increasing demands of the coal trade. Since the close of the financial year we have acquired by purchase an additional portion of the farm Goedgevonden, in extent some 360 morgen and situated on the southern boundary of our property at Oogies, thereby considerably strengthening the position of the company and providing scope for another pit which will probably be required later on.

Sale of Stands.

As you will observe from the report of the directors, 60 stands in Brakpan township were disposed of during the year. The total number sold since the inception of the township to the 31st of December last, was 256, the sale price being £40,957. Practically all stands, however, have been disposed of on the instalment system of payment, and an amount of £16,112 had, therefore, still to be collected. The actual revenue from this source has been sufficient not only to wipe out the cost of the ground on which the township is situated and all expenses incidental to its formation, but has also permitted the transfer of £2,170 to profit and loss account. In view of all the contemporary circumstances this must, I think you will agree, be regarded as satisfactory. The price of the stands and the terms of payment are very favourable to purchasers and, in view of the undoubted potentialities of the district, we hope for increased sales during the current year.

Drought and Output.

When we met last year I indicated that coal winning at De Rietfontein colliery would in all probability be stopped during 1913. It was found necessary to suspend operations almost immediately, and the whole of your company's allotment from the Transvaal Coal Owners' Association was transferred to Oogies. As was to be expected, some little time elapsed before the latter colliery could deal with the increased tonnage, and before the necessary additional plant had been fully installed the water supply was much reduced owing to continued drought. A serious curtailment of machine mining inevitably ensued, adversely affecting the tonnage, classification and value of the product to a material extent, and resulting in the company having to meet heavy penalties in terms of the agreement with the Transvaal Coal Owners' Association. Steps have been taken to obviate a recurrence of water shortage, including the construction of a new dam, and we are hopeful that in the future we shall not again be called on to cope with trouble of this nature. In common with all other mining companies operating to the industrial zone of the Transvaal Province, we have suffered considerably as the result of the strike of mine employes in July and the general strike of January last. Further, the reduction in working hours following the July strike increased the difficulty of dealing with emergency orders.

Profit Standard Regained.

The output of coal for the year amounted to 447,399 tons, which yielded a profit of £26,256. Compared with the 1912 profit from the same source this is a decrease of £12,123 4s. 9d., due mainly to the shortage of water and the attendant difficulties which the management has had to contend against As showing the adverse bearing of these difficulties, I may say that the working profit in respect of coal winning dropped from a monthly average of about £3,200 in the first half of the year to £347 in December. Since the end of the year, however, there has been steady and marked improvement We have now regained our former standard of profit on coal winning, to which, of course, must be added the income derived from our shareholdings, the township, and other sources of general revenue. You will observe that the amount standing to the debit of De Rietfontein Colliery has been reduced in £4,682 9s. 6d. by the transfer of that portion of the previous debit not represented by assets to premium on shares account. The depreciation written off the Oogies plant, etc., has, as usual, been dealt with through the profit and loss No. 2 account. The profit from coal winning and sundry revenue equalled 4.8 per cent. of the capital of the company, while dividends received on shareholdings equalled 15.1 per cent. The board was enabled thereby to declare two dividends for the year, totalling 17½ per cent., and to increase the carry forward by £13,008, equal to 2.4 per cent. on the capital. The carry forward may at first sight appear to reflect excessive caution, but, on consideration, I think shareholders will concur in the board's opinion that a company with such varied responsibilities as ours can hardly err in strengthening its financial position.

Mid-Yearly Dividends.

You will be asked to confirm as the contributions for the year the declaration of dividends Nos. 27 and 28 of 10 per cent. and 7½ per cent. respectively, absorbing an amount of £95,508. The matter of the mid-yearly dividend will not come up for decision till about the midle of next month, but I feel justified in saying that, in all probability, 7½ per cent. will be declared. The annual general meetings of Brakpan Mines and Springs Mines, in both of which you are largely interested, have been held this morning and a copy of the report of the proceedings at those meetings will be forwarded to you in due course. It is unnecessary, therefore, to further discuss their affairs. A change has been made in the personnel of the directorate, Mr. H. S. Johnson Hall replacing Mr. F. von Hessert. The members of the board—and I am sure all of you share their feelings—deeply regret that ill-health compelled Mr. Van Hessert to resign his seat. As you are no doubt aware, Mr. Von Hessert's death following shortly on his resignation. It is fitting that in conclusion I should express our thanks to Mr. C. E. Knecht for his services as consulting engineer; to Mr. J. F. Cook, our consulting mechanical engineer; to Mr. Williams, mine manager; and to Mr. Morris, business manager. Our thanks are also due to the members of the staff at the colliery, who have performed their duties loyally and well.

The report and accounts were adopted.

The appointment of Mr. H. S. Johnson Hall as a director in place of Mr. F. von Hessert, resigned, was confirmed.

Messrs. F. Elkan and G. Sonn were re-elected to the directorate.

Messrs. C. L. Andersson and Alex Aiken were re-appointed auditors.

BRAKPAN MINES.

The Year Reviewed.

Prospects Improving.

The eleventh ordinary general meeting of Brakpan Mines, Ltd., was held in the Board-room of the Corner House on Tuesday, May 26, Mr. W. L. Honnold presiding. Among those present were Messrs. C. Marx, R. J. Frecheville, F. R. Lynch, V. J. Ronketti, Max Elkan, G. Sonn, H. S. J. Hall, F. A. Unger, J. L. Jourdan, A. S. Pearse, A. F. Lyall, for the secretaries. There were 406,474 shares represented out of an issued capital of 750,000.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts said: The reports and accounts were issued to all shareholders on the 17th of March and have, I trust, made clear the position of the company, as well as the circumstances influencing the results of the year's operations. Our claim holdings have been somewhat increased through purchase from Government of the undermining rights to certain stands situated within the limits of the property. A total of 613,2[illegible] tons of ore was milled, realising a working profit of £290,790, the per ton figures being 28s. 3d. yield, 18s. 9d. working cost and 9s. 6d. working profit. After crediting the working profit with sundry revenue and deducting depreciation, there remained a balance of £305,149, which added to £51,091 carried forward from last year, gave us a credit of £356,240 in the appropriation account. Against this we made appropriations totalling £295,364, the items being, capital expenditure £[illegible],933, development suspense £14,851, Government tax and French fiscal tax £[illegible], dividends £213,75[illegible]. The balance forward to the current year is therefore £60,876, an increase of £9,785.

Disappointing Outcome.

The year's outcome, I need hardly say, is disappointing and materially different from what was in prospect when we last met. Then we were just in the way of overcoming the disorganisation consequent on an unusual subsidence of hanging wall, and it seemed that there would be an early improvement in results. Before this could be brought about, however, in fact almost immediately, we began to suffer through the labour unrest engendered by the strike on the property of our neighbour, the New Kleinfontein Company, and on the 30th of June we were obliged to suspend operations in consequence of the "pulling out" of our workmen. You are all familiar with the events which followed and know that, though a settlement was soon effected, the circumstances were such as to lead to further unrest and, ultimately, to the more recent "general strike" at the beginning of this year. With that occurrence and its outcome you are also so familiar as to make it unnecessary for me to say more than express the hope, which you doubtless share, that wiser counsels may hereafter prevail and the country be spared such ill-advised and unprofitable upheavals.

Impaired Efficiency.

It was inevitable that so prolonged a period of unrest should result in disorganisation and impaired efficiency, both in respect of white and native labour. But by far the most serious consequence was the unsettling of the native mind and the resulting shrinkage in the supply of labour of this class. At the end of November the total force on the mines had been reduced to 169,535, which was 62.248 less than the number employed prior to the first strike. To a considerable extent the reduction was attributable to seasonable fluctuation and the withdrawal of "Tropicals," but that labour unrest was largely responsible is shown by the fact that at the end of last month the strength was 188,780 or 43,000 less than a year previous, "Tropical" losses accounting for only 15,540

All-Machine Mine.

As pointed out by your consulting engineer, Brakpan suffered to an exceptional extent owing to its being an all-machine mine. The tonnage milled had to be reduced and, as circumstances called for an unrestrained policy in the matter of development, the proportion of the mill mixture derived from that and other low-grade sources not included in the ore reserve was so increased as to result in a yield considerably below what would otherwise have been realised. The consulting engineer, in his report, has dealt with the various adverse influences of the year in such detail that I need only recall to you that, in his opinion, they were responsible for a reduction of 3s. in the yield, as against an increase of about 1s. due to over mining.

Unfortunate Combination.

The unfortunate combination of events to which I have just referred as responsible for the restriction of milling and reduction in the grade was also unfavourable to working costs and precluded the realisation of our hope that the latter half of the year would show improvement. The low percentage of payability obliged us to follow a vigorous policy as to development, and, when coupled with the restriction of milling, made it necessary to increase the fixed charge under this heading from 1s. 6d. to 2s. 6d. per ton. There was also added expense under the Miners' Phthisis Compensation Act, the whole of which is now included in working costs, and, of course, there was the adverse influence of the industrial unrest I have previously referred to, as well as the extra charges arising directly out of the strike. On analysis, therefore, it is clear that, had the conditions formerly indicated as normal continued to be realised, a larger tonnage would have been crushed, the grade would have been about as anticipated, working costs would have shown improvement, and the profit would have been correspondingly greater. We had, however, to suffer an unexpected and unusually perverse combination of transient misfortunes, and even to-day have not regained our former position.

Development Disappointing.

I have already alluded to the situation as to native labour, but would add that it is possible the seasonal losses of the next few months, when coupled with further withdrawal of our "Tropical" complement, may result in some curtailment of operations, this, however, being problematical, as it is impossible to forsee the exact bearing of various factors, including the favourable influence of the prevailing droughts. Then we have the matter of development. Last year was disappointing in this respect, but there was always the reassuring consideration that the mine had previously shown similar irregularity, and that what seemed but a bad phase would soon be followed by a more or less compensating period of good results. This view was strengthened by the tendency of development to improve, a tendency which became distinctly marked in the later months of the year; in fact, during the final quarter, 51 per cent of the development on reef was in profitable ore as against an average of 55 per cent. for the whole of the footage accomplished since the opening of the mine. Unfortunately, however, there was, as you are aware, a reversal of tendency during the succeeding quarter, when only 30 per cent. of the footage on reef was of payable value. April results were of about the same standard, and, though we are now meeting with encouragement at several important points, it has to be recognised that, so far, this year's development has been disappointing. I suggest, however, that the significance of the present showing may easily be taken too pessimistically, for the major portion of the property is still unprospcted, and, if one accepts the evidence of our own and neighbouring experience, he cannot but assume a recurrence of good results as development proceeds. Of course, anything may happen in mining, but, having all along interpreted the mine to you as involving the possibility of exceptional irregularity, I am not now disposed to view other than philosophically the current bad phase, even though it has been more prolonged than seemed probable.

Ground for Satisfaction.

There is ground for satisfaction in that, notwithstanding the poor showing of the year's development, the ore reserve was not unduly depleted and was essentially of unaltered grade. Your consulting engineer has interpreted the significance of the value arrived at with as much definiteness as circumstances will permit, and has made it clear that the yield will probably vary between 26s. and 29s., according to the bearing of the various factors involved. The lower limit may be regarded as an unlikely extreme, but, on the other hand, there is now less probability of the higher figure being realised than when Mr. Knecht's report was written, for the labour position precludes the hope that the former standard of tonnage will be reached this year; and, furthermore, the disappointment as to development renders it inadvisable for the time being to aim at so high a standard even if adequate labour were in prospect. I think I am justified in saying, however, that, with so large an ore reserve and with haulage ways so well advanced as to ensure unusual progress in the further opening of the mine, there is no reason at this stage to contemplate greater restriction of milling than that forced on us through shortage of labour. It amy interest you to hear that this month's crushing promises to exceed 50,000 tons.

Higher Working Costs.

The higher working costs of the current year call for some explanation. In so far as the work performed is concerned, there is clear evidence of improved efficiency. For instance, in the matter of stoping, the cost per square fathom, notwithstanding less favourable breaking conditions, has been reduced to 72s. 9d., as compared with 75s. 3d. last year, and 77s. 9d. the year previous. Unfortunately this improvement, together with that in respect of other operations is obscured by the preponderating influence of the period of bad development which has overtaken us. In such a period the expenditure on development is relatively higher than in normal times, and, of course, the proportion of labour available for stoping is reduced. Furthermore, most of the rock derived from development is, for the time being, of so unprofitable a grade as to preclude its inclusion in the mill mixture. The tonnage milled is, therefore, now reduced to a point even below the limit imposed by labour shortage, and, in such circumstances, working costs cannot but be correspondingly increased. The costs of recent months, however, cannot but be regarded as exceptionally high, since, in addition to the abnormal influences referred to, there has been extraordinary expenditure on trucks and machine drills of improved type. With regard to the capital expenditure of the year, amounting to £9,993, I may say that it covered the installation of two new tube mills and the extension of our compound, hospital and change house accommodation. A spare locomotive also was purchased, as well as the forty stamps required to complete the mill. The latter, owing to the misfortunes of the year, have not yet been erected. The votes passed in respect of capital expenditure this year, added to the unexpended portion of votes forward from last year, amounted to £3,327 at the end of last month, and the expenditure on excess development to £1,612 18s. As against capital expenditure, we had a credit amounting to £7,089 19s. 6d. arising out of the sale of some of our Victoria Falls and Transvaal Power Company shares.

Dividends Declared.

Dividends declared during the year represented 32½ per cent. on the issued capital of the company. You will be asked to confirm the action of directors in this connection. The matter of the mid-yearly dividend will not be decided by the Board till about the middle of next month. I may say, however, that it is probable the rate will be 12½ per cent., and that the carry forward will be somewhat increased. During the year Mr. M. G. Elkan vacated his seat on the Board, his resignation being accepted with regret and with acknowledgements of his services to the company since its inception. Mr. H. Neuhaus was elected to fill the vacancy thus created, and his appointment will come before you to-day for confirmation in accordance with the terms of the company's articles. Before concluding my remarks I am sure you will wish me to tender our thanks to Mr. Knecht, the consulting engineer; to Mr. Cook, the consulting mechanical engineer; and to Mr. Davis, the general manager at the mine, for valuable services rendered during the year. Our thanks are also due to members of the staff and other employees who stood by us in a particularly anxious period of the mine's history.

The report and accounts were adopted.

The appointment of Mr. H. Neuhaus as a director of the company in the place of Mr. M. G. Elkan, resigned, was confirmed. Messrs. E. J. Renaud and H. S. Johnson Hall were re-elected to the directorate.

Messrs. Thos. Douglas and Mr. A. E. Page were re-appointed auditors.

CONS. LANGLAAGTE.

Increase in Profits £128,394.

Excellent Prospects.

The eleventh ordinary general meeting of the shareholders in the Consolidated Langlaagte Mines, Ltd., was held this week in the boardroom, Consolidated Buildings. Mr. J. Munro was in the chair, and among those present were Messrs. C. Marx, P. Richardson, J. F. Rutherford, C. Sampson, E. Danckwerts, P. A. Roulton, H. W. Anderson, H. Vickers, J. G. Lawn, consulting engineer, and F. Hall, representing the secretaries.

The Chairman said: I have pleasure in submitting for your consideration the directors' report and audited accounts for the year ended the 31st of December, 1913, as also the reports of your consulting engineer and mine manager, which contain the fullest details of the year's operations. You will have observed from the directors' report that your capital is now 950,000 shares of £1 each, all issued, the option on the 217,321 reserve shares having been exercised. As authorised by shareholders at the special general meeting held on the 28th of May, 1913, your directors made an issue of £300,000 debentures at £98, which carry interest at the rate of 5½ per cent. per annum. The funds received from the issue of the reserve shares and debentures were utilised in repaying your indebtedness to the Johannesburg Consolidated Investment Company, Ltd., and redeeming the balance of the outstanding debentures of the previous issue. A substantial cash balance was carried forward after providing for all liabilities. The work at the mine during the year has been attended with a considerable measure of success. The tonnage crushed, namely, 523,100 tons, shows an increase of 228,028 tons as compared with the previous year.

Working costs show a reduction of 1.446 shillings per ton, the average for the period under review being 17.617 shillings per ton milled. Naturally with the increased tonnago crushed and the reduction in working costs the gross profit for the year as compared with 1912 reflects a substantial increase amounting to £128,391. For the first four months of 1914 there was a further reduction in working costs of 2s. per ton. The tonnage milled amounted to 168,600 tons, and the gross profit totalled £86,725. It afforded your directors great pleasure to be able to declare the first dividend of 10 per cent. to all shareholders registered on the 31st of December, 1913.

UNDERGROUND POSITION.

Your consulting engineer reports that the development for the year has exposed ore of satisfactory value. The bulk of the work carried out was at the southern section of your property where large bodies of payable ore were opened up on both the south reef and main reef leader between the west and east shafts, and also to the east of the east shaft. From the latest information to hand, the position underground is most encouraging, and there are indications of an improvement in values to the west of the west shaft. The eighth level on the south reef, which is the lowest working between the two shafts, is being extended both from the west and east shafts, and should shortly make connection. In both ends the values have been good. During April the drive from the west shaft was extended 40 feet in reef averaging 19.2dwts. over 23.1 ins., and the connecting drive from the east shaft was advanced 62 feet in reef averaging 32.6dwts., over 12.8 inches. The main reef leader is also opening up well, and generally speaking the prospects of the mine are excellent. During 1913 the west shaft was sunk 41 feet to an incline depth of 2,640 feet, and the east shaft 260 feet to an incline depth of 2,965 feet. Since the end of the year a further 114 feet of sinking has been accomplished in the east incline. The work at the mine was considerably hampered owing to the industrial unrest which was general in the middle of the year. Not only was there an actual loss of profits owing to the hanging up of the mill, but the trouble had a most unsettling effect on the natives' minds and after work was resumed a great shortage of native labour was experienced, and consequently operations were restricted. Since the beginning of 1914, the number of natives on the mine has shown a substantial increase. A revaluation of the ore reserves at the end of the year showed that the payable tonnage amounted to 2,194,408 tons of a value of 7.4dwts., and it is anticipated that the recovery value will be 6.4dwts. It should be noted that the unit of payability has been increased from 4 to 4½ dwts. It is estimated that the ore below the payable limit amounts to 1,319,283 tons averaging 2.7dwts. over 47.4 inches.

ACTION FOR DAMAGES.

It is stated in the directors' report for the year ended the 31st of December, 1912, that the company sustained serious loss by the failure of the Victoria Falls and Transvaal Power Company, Limited, to supply this company with requisite power at an agreed on date. An action for damages was instituted in consequence of this default. The case was tried early in April of this year and resulted in substantial damages being awarded to your company. We have been advised that the defendant company intends to lodge an appeal against the judgment. Having a substantial cash surplus on hand your directors recently purchased debentures to the value of £30,000 at £98 per cent., which purchase not only substantially reduces the company's debenture liability, but effects a considerable saving in interest. This purchase of debentures will not affect the first annual drawing of £25,000 which takes place on the 30th of June, 1915.

I now beg to move the adoption of the directors' report and accounts.

Mr. H. W. Anderson, in seconding the adoption of the reports and accounts, said the shareholders ought to congratulate themselves on the satisfactory position that had been placed before them. In spite of the recent industrial troubles and their consequent unsettling effects and the serious shortage of native labour in the latter half of the year, the mine had shown steady improvement in all departments. The very substantial reduction in working costs of 1.4446 shillings last year was excellent; but since then, as the chairman had said, for the first four months of this year there had been a still further reduction of 2s. a ton, bringing the costs to about 15s. Those facts reflected very great credit on the management, and when one took into consideration the satisfactory cash position, the increased tonnage with the consequently gradually increased profits, the improvement in the ore reserve and very encouraging results in the lower levels of the southern section, shareholders might, he thought, provided they had more settled conditions of working during the current year, look forward to still better results.

The report and accounts were adopted.

Messrs. S. B. Joel and G. Imroth, the retiring directors, were re-elected.

Messrs. Henry Hains and Thomas Douglas, the retiring auditors, were reappointed.

WITWATERSRAND G.M. CO.

Increased Profit £37,720.

Bright Prospects.

Mr. John Munro presided at the annual ordinary general meeting of the shareholders in the Witwatersrand Gold Mining Company, held this week in the boardroom, Consolidated Buildings, and others present were Messrs. Charles Marx, P. Richardson, A. G. Gill, J. Dale Lace, L. Edwards, H. Nourse, C. P. Marais, W. Ross, J. G. Lawn (consulting engineer), and F. Hall (representing the secretaries).

The Chairman said: If gives me pleasure to submit for your consideration the directors' report and audited accounts for the year ended the 31st of December, 1913. There are also attached the reports of your consulting engineer and mine manager, which, as usual, contain the fullest information for the period under review. In May, 1913, the capital of your company was increased by [illegible] shares of £1 each. This makes the authorised capital of your company 470,000 shares of £1 each, of which 469,625 are issued fully paid, and the balance, namely 5,375 shares, are held in reserve. This increase of capital was necessary in order to provide additional funds, without unduly encroaching on the profits of the company, to complete the equipment of the southern section of your property and to make provision for shaft sinking there. The profits for 1913 show an increase of £37,720 as compared with the previous year. This was largely due to the improved grade of the ore milled, as working costs were unaltered, and there was a decrease of 8,450 tons in the quantity of rock crushed. The new tube mill installation commenced working in October, and effected a substantial improvement in the extraction, the value of the residues in December being reduced to .262dwt., as compared with an average residue for the year of .477 dwt. For the first four months of 1914, 158,090 tons were crushed, working costs averaged 13.757 shillings per ton, and the gross profit amounted to £92,076. It will be seen that the costs show a reduction of a shilling per ton as compared with 1913.

LABOUR SHORTAGE.

Your mine suffered severely from a shortage of native labour due to the industrial unrest in July, and this shortage became so acute that work on the southern section of the mine had to be suspended, besides which the ordinary work of the mine was interfered with. This state of affairs materially affected the returns for the last six months of the year. Development at the southern section during the year was attended with gratifying results, and it was a matter for considerable regret that work had to be suspended there owing to the causes which I have mentioned. To this stoppage was largely due the fact that the payable ore reserves on the mine showed a decrease at the end of 1913, when they were calculated to stand at 1,225,688 milling tons of an estimated recovery value of 6.4dwts. The unwatering of the vertical shaft was put in hand early in 1914, and the sinking of the south incline shaft was resumed in February, the footage of sinking accomplished up to the end of April being 192 feet Development in this section is now proceeding apace, and very satisfactory values are being exposed. From the information that we have secured, we are satisfied that the area north of the vertical shaft contains reefs of considerable width and excellent value. To the south-east of the vertical shaft the Wit. Deep Company has exposed satisfactory values in their development drives in the direction of our boundary, and these results would seem to indicate that the ground for a good distance south of the vertical shaft will be of good grade. I might mention here that an arrangement has been come to with the Wit. Deep Company whereby the Witwatersrand Company will have the right to purchase from the Wit. Deep Company 50 per cent. of the claims which that company secured from the New Transvaal Chemical Company some time ago. The price which we shall have to pay will be the same as that paid by the Wit. Deep Negotiations are now proceeding with a view to adjusting the respective boundaries, so as to render the ground easily accessible to both companies. Adjoining the Chemical Company's claims is a block of about fourteen claims owned by this company, but detached from our main holding. The adjustment referred to above will eliminate the intervening area, and will be the means of adding to our eastern boundary a compact block of twenty claims, which can be readily worked from the south incline shaft. This arrangement is a substantial advantage to your company, and we look forward with confidence to a long and profitable life. I now beg to move the adoption of the report and accounts.

"FUTURE FULL OF PROMISE."

Mr. J. Dale Lace said: I have very much pleasure in rising to second the adoption of the report, balance sheet and profit and loss account. After the able way in which the chairman has dealt with the business of the company there is little left for me to say. This I can truly say that never in the history of the company have prospects been brighter than they are to-day. In spite of every drawback you have received your usual dividend. Your cash position is a very strong one. You have added enormously to the life of your mine by the development of your southern section and the wise acquisition of other claim interests. And what is still better is the fact that both in width and in values the development to which I have referred is remarkably good, so that our future would seem to be very full of promise. I look to the future hopefully for a considerable cheapening of costs by reason of greater efficiency, and particularly the use of hammer drills. It is a little early in the day to predict what may happen in the way of enhanced values, but prospects in that direction are distinctly hopeful. I should like to bear testimony to the able manner in which the business intricacies of the company's affairs have been handled by this controlling house, and to the excellent work done by the engineering department, the management and the staff. The control of the company's interests in every department shows evidence of careful and capable handling, and the shareholders are to be congratulated on the results attained and on the future outlook.

The reports and the accounts were adopted.

Messrs. C. Marx and J. Munro, the retiring directors, were re-elected.

Messrs. F. W. Diamond and English and Charles Stuart were reappointed auditors.

NEW UNIFIED MAIN REEF.

Working Costs Reduced 3s. 8d. a Ton.

Stope Drill Experiment.

The sixteenth ordinary general meeting of the shareholders in the New Unified Main Reef Gold Mining Co., Ltd., was held this week in the board room, Consolidated Buildings. The chair was occupied by Mr. J. Munro, and among those present were Messrs. C. Marx, P. Richardson, J. F Rutherford, E. Brayshaw, C. Sampson, E. Danckwerts, E. M. Hyman, J. G. Lawn, consulting engineer, and F. Hall, representing the secretaries.

The Chairman said: I have pleasure in submitting for your consideration the directors' report and audited accounts for the year ended 31st of December, 1913, to which are attached the reports of the consulting engineer and mine manager, giving the fullest information with regard to the operations of your company for the year. During that period 147,390 tons of ore were crushed, being 15,065 tons in excess of the previous year, but the gross profit shows a small decrease. The average working costs amounted to 17s. 7d. against 21s. 3d. for the previous year, a reduction of 3s. 8d. per ton. These figures, however, do not fully indicate the improvement made during the year, for while costs in January were 19s. 5d., in December they were reduced to 16s. 4d. This satisfactory feature in the working of your property is attributable to improvements in underground organisation, the more extensive use of small water-carrying stope drills, and in a slight degree to the larger tonnage crushed. In this connection it gives me great pleasure to draw shareholders' attention to the interesting experiments which were made during the year with a new type of stope drill. The figures for the last three months of the year were very satisfactory, and the information given in the manager's report is well worth the consideration of all interested in the industry. The results obtained for the first four months of the current year show a gold recovery of 22.785s. per ton over 49,630 tons milled. The working costs were 15.043s. per ton, an improvement of 2s. 6d. per ton as compared with 1913. For April the working costs reached the low figure of 14.399s. per ton. This reduction in working costs has a far-reaching effect on the life of your mine, as it enables us to crush ore at a profit which was formerly considered unpayable, and still keep up the average monthly profit round about £5,000 Besides patches of ore which were previously left in the upper workings on the main reef leader, and particularly on the South Reef, on account of their low grade, there is in the mine a large tonnage of main reef readily available, much of which can be profitably won if the present low level of working costs can be maintained. Reduction in working costs certainly means "speeding up" to some extent, and it is asserted by some people that "speeding up" means an increase in danger to the workers employed underground. Such is not our experience. The utmost care is devoted to the ventilation of the mine, to the laying of dust, and to the safety of the workmen. The New Unified has one of the cleanest accident records on the Witwatersrand, and we have not had a fatal accident for nearly two and a half years. Your directors have continued the policy outlined in my remarks at the last meeting of sharholders, of reducing the percentage of rich main reef leader going to the mill, and increasing that from the south reef, which is opening up beyond our expectations. At present only 30 per cent. of the ore sent to the mill is taken from the main reef leader, the remainder coming from the south reef, reclamation work in the upper levels, and to a small extent from the main reef.

ORE RESERVES.

The ore reserves were re-estimated at the end of the year, and now stand at 387,500 milling tons, of an estimated recovery value of 5.9 dwts., as against 275,028 tons at the end of 1912, valued at 6.4 dwts., showing an increase of 112,474 tons. The increase in tonnage and the slight reduction in average value are due in part to the inclusion of certain blocks of ore formerly considered unpayable. The year's operations resulted in a profit of £60,069 5s. 4d., to which has to be added £17,092 0s. 11d. carried forward from the previous year, making an available amount of £77,161 6s. 3d Out of this sum two dividends of 10 per cent. each, absorbing £50,000, were paid. Profits tax, contributions to the compensation fund under the Miners' Phthisis Act, and sundry small amounts absorbed £6,970 10s 1d., and a balance of £20,190 16s. 2d. is carried forward to the next account. In December last Mr. E. A. Douglas resigned the management of the mine on being transferred to another mine of the group, and was succeeded by Mr. W. A. Krige. I now beg to move the adoption of the directors' report and the accounts.

SATISFACTORY POSITION.

Mr. Charles Marx, in seconding the adoption of the report and accounts, said he wished to emphasise what low working costs meant to the mine. With their present costs—and he [illegible] that they would be still further reduced they would be able to crush a very large tonnage of ore that at present was not taken into their ore reserves, and they would be able to crush it profitably, as it could be worked cheaply. He did not want to say anything about the life of the mine, as that was a ticklish subject, and they were always watched about it by the authorities. He had no doubt that they would be able to work the little Unified a good many years to come yet at a profit. The directors were proud, and he was sure the shareholders also had every reason to be proud of it. It stood out among its neighbours as a profit-earning mine. He was perfectly sure that they should be satisfied with the results of their working, and he had no doubt that this would apply in the future.

The report and accounts were adopted.

Messrs. C. Marx and E. Brayshaw, the retiring directors, were re-elected, and Messrs. John Mackillican and Ferryman and F. W. Bompas were reappointed auditors.

NEW PRIMROSE.

Reduced Working Costs.

Unavoidable Grade Fluctuations.

The annual ordinary general meeting of the shareholders in the New Primrose Gold Mining Co., Ltd., was held this week in the Board-room, Consolidated Buildings. Mr. J. Munro was in the chair, and among those present were Messrs. C. Marx P. Richardson, J. F. Rutherford, E. Brayshaw, F. W. Diamond, E. Rothschild, J. R. Nicholson, J. Berry J. G. Lawn, consulting engineer, and F. Hall, representing secretaries.

The Chairman said: I have pleasure in submitting for your consideration the directors' report and accounts for the year ended the 31st of December, 1913.

Chairman's Speech.

The working profit for the year was £218,313 2s. 5d., a decrease as compared with 1912 of £2,506. On reference to the mine manager's report, it will be observed that the average value of the ore crushed for the period under review was less by .372 dwts. as compared with 1912. On the other hand the tonnage crushed shows an increase of about 6,800 tons as compared with last year, and the working costs were reduced by 4d. per ton. The amount available for distribution, after adding the balance of £22,545 13s. 7d. brought forward from 1912 was £240,858 16s. After providing for payments due under the Miners' Phthisis Acts, profits tax, etc., your directors were able to declare two dividends of 30 per cent. each, and to carry forward to the next account the sum of £21,565 11s. 1d. For the first four months of the current year 93,300 tons were crushed at a profit of £50,470. Working costs were 12.737 shillings, a reduction of 1s. 6d. as compared with 1913. The Primrose has now arrived at that stage in its life when fluctuations in grade are unavoidable. As indicated in the annual report, we did not anticipate that the high scale of profits which was experienced in 1912 and 1913 would be continued, but it is reasonable to assume that the grade of the ore worked during the last four months is on the low side, and that the next few months will show some improvement. Small areas of main reef still remain to be developed, but apart from this it may be taken that the development of the mine is practically completed, and further accretions to the ore reserves can only be made by the discovery of patches of ground which may have been left in the old workings. An idea of the amount of reclamation and exploratory work which is being carried on in the mine can be gained from the fact that though 93,300 tons of ore were milled during the first four months of this year, the ascertained ore reserves have only been depleted by 21,617 tons.

REDUCED RESIDUE.

In 1912 prior to the installation of the tube mills the final residue was somewhat high, and as indicated in my remarks at the last meeting, when I predicted an improvement, it affords me pleasure to be able to state that the residue for the year 1913 has been reduced to .248dwt. per ton. Under the heading of "Treatment of Accumulated Slime," it will be noticed that only £3,560 profit was made compared with £13,722 for the previous year, and in this connection it will be observed that the consulting engineer reports that the accumulated slime still available for treatment at the end of the year was only about 6,000 tons. In the older sections of the mine exploratory work has revealed the existence of considerable patches of reef showing good value. On the southern series a certain amount of development was carried out, but only a small quantity of ore in this series is included in the payable ore reserves owing to the grade being somewhat low. From the mine manager's report it will be observed that of the total tonnage milled during the year 51.27 per cent. was obtained from reclamation in the old workings. At the end of the year the ore reserves were re-estimated, and it was calculated that the payable tonnage amounted to 401,045 milling tons of an estimated recovery value of 6.2dwts., both figures being practically the same as at the end of 1912. The native labour force on your mine during the year under review has been sufficient for all requirements. I now beg to move the adoption of the report and accounts.

Mr E. Brayshaw, in seconding the adoption of the report, said he was the oldest member of the company. He was reminded of a conversation he had had with his friend Rothschild ten years ago, when he asked him about the life of the mine, and he told him that the Primrose in ten years' time would be still making decent profits. In spite of all the amalgamation that had been going on this company had always held aloof. They started with 42s. a ton working costs. They were pleased when they got it to 40s., and extremely pleased when they got it down to 30s. Now they were down to 12s. 6d. In the early days their greatest trouble was water. They had no water, and they had to beg, borrow or steal it. In spite of all the difficulties they stood to-day with an unblemished record.

The report was adopted unanimously.

The Chairman remarked that the mere fact of having just over 400,000 tons of ore undeveloped of 6.2 dwts. surely indicated that none need be afraid that the life of the mine was nearly exhausted.

Messrs. C. Marx and E. Brayshaw, the retiring directors, were re-elected, as also were the auditors, Messrs. F. W. Diamond and English, and Mr. J. P. O'Reilly.

GINSBERG G.M. CO.

Shortage of Native Labour.

YEAR'S PROGRESS OUTLINED.

The nineteenth ordinary general meeting of Ginsberg Gold Mining Company, Limited, was held in the board-room, Consolidated Buildings, this week, Mr. John Munro presiding. Among those present were Messrs. Charles Marx P. Richardson, J. F. Rutherford, H. A. Rogers, R. B. Greer, J. P. O'Reilly, Professor Lawn, and Frank Hall (for the secretaries).

The Chairman, in moving the adoption of the report and accounts, said: I have much pleasure in submitting the directors' report and the audited accounts for the year ended the 31st of December, 1913. The profit made during the year amounted to £72,811, as compared with £83,448 which was the profit made during the previous year. The decrease is mainly due to the grade of ore milled, being nearly a pennyweight less than that milled in 1912. The tonnage crushed, however, was increased by 8,175 tons, and the working costs showed a reduction of a little over 9d. per ton milled. The extraction again shows a slight increase. To the profit of £72,811 6s. 10d. should be added the sum of £19,967 19s. 4d. carried forward from last year, giving an amount of £92,779 6s. 2d. available. After paying two dividends of 17½ per cent. each, and providing for profits tax and payments called for in connection with the Miners' Phthisis Acts, and writing off an amount for depreciation on investments, the sum of £11,229 9s. 4d. is carried forward to the next account. For the first four months of the current year the grade of the ore milled has shown a further falling off mainly owing to the shortage of boys which has prevented the whole of the ore milled being drawn from the mine, and has made it necessary to take a certain amount of ore from an old development dump which is of low grade. So that in spite of a reduction of one shilling per ton in working costs as compared with 1913, it has not been possible to maintain so high a rate of profit. For the four months the profit amounted to £17,767. The erection of the plant for treating accumulated slime was completed towards the end of September, and from the treatment of 2,111 tons a profit of £498 was realised. Your consulting engineer anticipates that during 1914 a substantial improvement will be shown under this head The ore reserves were, as usual, re-estimated at the end of the financial year, and it was calculated that the payable ore reserves amounted to 312,540 milling tons of an estimated recovery value of 6dwts. During the year the main development work accomplished was that of driving on the 9th level east from the north shaft. This drive was continued for a considerable distance, and was in reef matter the whole time. It is gratifying to be able to state that the reef exposed by this development was satisfactory both as regards thickness and value. Since the end of the year the cross-cut at the 10th level has intersected the reef, which at first was of low grade, but it has recently improved in value. For the latter six months of the period under review the mine was severely handicapped by an inadequate supply of native labour, and it is still suffering in this respect.

The report and accounts were adopted.

Messrs. S. B. Joel and H. A. Rogers were re-elected directors.

Messrs. Henry Hains and J. P. O'Reilly were reappointed auditors.

NEW RIETFONTEIN.

New Basis of Working.

The seventeenth ordinary general meeting of shareholders in the New Rietfontein Estate Gold Mines, Ltd., was held in the board-room, Consolidated Building, this week, Mr. John Munro presiding. Among those present were Messrs. Charles Marx, Professor Lawn, P. Richardson, J. F. Rutherford, H. A. Rogers, T. G. Suter, W. P. Fisher and Frank Hall (for the secretaries)

The chairman, in moving the adoption of the report and accounts, said: I beg to submit the directors' report and audited accounts for the year ended the 31st of December, 1913, and the reports of the consulting engineer and mine manager, which fully detail the year's operations. During the year seventy-one claims to the north of the reef conveniently situated for depositing slime and tailings were purchased at a cost of £500. Otherwise your property remains unaltered. The ore milled during the year shows a decrease of 3,517 tons as compared with 1912. The gold recovered was 4s. per ton less than for that year. Against this working costs were reduced by 1s. 8d. per ton. The profit from all sources was £19,856 12s. 8d., to which has to be added the balance of £6,945 10s. 8d. carried forward from the previous year. A dividend of 2½ per cent. was declared at the end of the year, which absorbed £15,252 2s. Sundry payments and the amount written off account for £1,011 5s. 8d., and £10,538 15s. 8d. is carried forward to the current year's account. Though the net results of the year's work show a profit, as you are aware, the mine was worked at a loss in December Seeing that the prospecting work carried on for several years failed to discover the Rietfontein reef to the south of the dyke which cuts it off to the dip, and also that the development in the neighbourhood of No. 1 shaft had proved disappointing, it was felt that the mine could not be worked on the scale of the past few years with any hope of success. There were, however, a number of patches of payable ore available, and it was thought that detailed investigation might expose other payable patches, so it was decided to completely reorganise the working of the mine on the basis of crushing some six thousand tons of ore per month. This was done at the end of February. Two months' experience seem to indicate that the reorganisation has been successful, and it is hoped that it will be possible to run the mine on the reduced scale at a profit for some time to come.

The report and accounts were adopted.

Messrs. J. Munro, S. B. Joel, H. A. Rogers, J. Friedlander, E. Brayshaw, C. Marx and G. Imroth were re-elected directors.

Messrs. Thos. Douglas and Henry Hains were reappointed auditors.

VAN RYN DEEP.

Gross Profit £105,022.

Even Grade Maintained.

The ninth ordinary general meeting of the shareholders in the Van Ryn Deep, Ltd., was held this week, in the board-room, Consolidated Buildings. Mr. J. Munro was in the chair, and those present included Messrs. C. Marx, W. Dalrymple, P. Richardson, H. A. Rodgers, A. G. Gill, J. H. Ryan, J. F. Rutherford, J. R. Nicholson, F. Hilner, C. Grosser, H. R. Saunders, J. J. Hardwick, William May, A. J. Young, H. W. Anderson, A. G. Gill, M. Dold, F. W. Baxter, H. J. Raubenheimer, consulting engineer, and F. Hall, representing the secretaries.

The Chairman said: It gives me pleasure to submit the directors' report and balance sheet for the year ended the 31st of December, 1913, to which are attached the reports of your consulting engineer and mine manager for the same period. Milling operations commenced on the 14th of July, 1913, and but for the unfortunate industrial unrest which took place in the district early in that month a start with the reduction works would have been made at the beginning of the month. Though several factors tended to restrict the scale of operations, the results obtained were gratifying. The ore crushed amounted to 182,000 tons, and the recovery value averaged 7.382 dwts The gross profit realised was £105,022. A considerable tonnage of ore milled was obtained from the surface dumps, and included a proportion of low grade development rock. Working costs for the period under review were 19.906 shilings per ton. For the first four months of this year 143,740 tons of ore were crushed. The recovery amounted to 33.086 shillings per ton, and working costs averaged 18.381 shillings. The total gross profits amounted to £107,666. The working costs for April were 17.42 shillings per ton, and it is hoped that a further reduction will be secured in coming months. The strike in January caused some dislocation, and it was not till the month of April that the plant was called on to treat the tonnage for which it was designed. An even grade has been maintained, and the steady increase in profits has been due to the greater tonnage crushed month by month and the reduction in working costs. The surface dumps are still being drawn on to make up the mill tonnage. In April some 5,000 tons of ore were obtained from this source. Our principal object in milling this amount of dump rock is to reduce the amount standing to the debit of advance stoping account, which at the end of the year was £22,876. At the end of April this debit had been reduced to £15,979 and in the same period the credit to the development suspense account had been increased from £8,065 to £13,585.

SINKING OF INCLINES.

The sinking of both east and west inclines has been resumed, and the latter will shortly have reached the requisite depth to permit of the cutthing of the seventh level station. The east drive from this level will rapidly render available for stoping large blocks of ore as two winzes have already been sunk to this plane. At the eastern end of the mine satisfactory values have been exposed in both the fifth and sixth levels, and at the western section ore of good value has been opened up from the fourth and fifth levels. Taken altogether, the position is most hopeful, and there is every reason to anticipate increased profits in the immediate future. The payable ore reserves at the 31st December, 1913, were estimated to amount to 1,953,845 stoping tons of an average assay value of 8.6 dwts., this tonnage being based on an average stoping width of 55 inches. Your consulting engineer estimated that allowing for 15 per cent. of sorting the milling tonnage stands at 1,660,760 tons, of an assay value of slightly over 10 dwts. The recovery value of this ore is probably in the neighbourhood of 35s. As compared with 1912 the milling tonnage shows an increase of 574,464 tons, and an improvement in assay value of 1.7 dwts. A dividend of 7½ per cent. was declared at the end of the year. This was possible owing to the fortunate position which the company was in of not having spent all its capital before production was commenced. There is still a substantial amount of capital remaining, and this means that practiclly the whole of the net profits made will be available for dividends for some time to come. At the beginning of December Mr. E. A. Douglas assumed the management of the mine in place of Mr. W. A. Krige, who was transferred to another mine of the group. I now beg to move the adoption of the report and accounts.

MERITORIOUS PROGRESS.

Colonel Dalrymple said: I have much pleasure in seconding the adoption of the report which is before us and which has been so clearly reviewed by our chairman. There is not much to be added except to congratulate you, sir, and the management on the results of the past year's working; I may, however, be allowed to touch on one or two points in connection with our operations which especially appeal to me. The first of these is the rapidity and smoothness with which the mine and plant have been worked up to their maximum capacity, especially in the face of very great difficulties. Even in normal times I think the starting up would be very creditable, and when you consider that our works had to commence running immediately after the conclusion of a most disorganising strike; and, further, that another industrial disturbance occurred less than six months after the start, and that throughout all the period under review we were, and still are for that matter, suffering from an extreme shortage of native labour, I am sure you will agree with me in saying that the rapidity of the progress made is most meritorious. The progressive increase in tonnage milled and the steady reduction in costs down to the present figure of 17.42 shillings per ton, more particularly taking into consideration the disturbed nature of the country which had to be negotiated, could only have been effected by working at very high pressure, and I think our thanks are due to those who have had in hand the carrying out of this work on behalf of the company. The other point to which I should like to draw your attention is in connection with the development of the west section of the mine. It will be remembered that the reef, where intersected by the west shaft, was of low grade, and, in general, I may say the values from the development west of the west shaft have given, till recently, very disappointing results. It is, however, significant to notice, from our chairman's remarks, that ore of good value is being opened up on the lower levels of this section. Should further development on these levels substantially the prospects of the company will be considerably enhanced, and undoubtedly the discovery of good ore in this section is a most hopeful sign for the future, and, if I may say so, I think it should be the policy of our technical advisers to push the exploration and development of this section in order to avoid too great a strain on the resources of our well-established rich section.

In answer to a shareholder, the chairman said a vigorous policy was being mapped out in connection with the opening up of the western section, and as the native labour force increased the company would be able to push that section more and more with the prospects of opening of ores of very great value; if they could rely on what they had opened up on the 4th and 5th levels of the west shaft.

The report and accounts were adopted.

Messrs. S. B. Joel and J. H. Ryan were re-elected to the directorate.

Messrs. Alex. Aiken and Henry Hains were reappointed auditors.

GOVERNMENT AREAS.

Mill Running by End of Year.

Encouraging Development Results.

The fourth ordinary general meeting of the shareholders in the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., was held this week in the Board-Room, Consolidated Buildings. Mr. J. Munro was in the chair, and among those present were Messrs. C. Marx, P. Richardson, G. Sonn, F. L. Marx, C. Sampson, E. Danckwerts, A. G. Gill, F. W. Baxter, Emil Lewin, J. Carey, V. J. Ronketti, J. G. Lawn, consulting engineer, and F. Hall, representing the secretaries.

The Chairman said: I beg to submit the directors' report and balance-sheet for the year ended the 31st of December, 1913, to which are attached the reports of the consulting engineer and mine manager, giving full particulars of the year's operations. During the year both the south-east and south-west shafts reached the reef: the former at a depth of 3,579 feet, and the latter at a depth of 3,608 feet. Both shafts were sunk the necessary depth below the reef to provide ore bins, and our shaft sinking is now completed. As notified at the time, the results from the south-east shaft were of high grade, but the reef struck in the south-west shaft was not so encouraging. Since the reef was struck, however, driving from this shaft has opened up high grade ore. Though hindrance was met with owing to the strike in July and the shortage of native labour it brought in its train, yet development was pushed ahead. The two northern shafts were connected, thus ensuring efficient ventilation in that section of the mine. Details of the development accomplished, and of the grade of the ore exposed, are given in the manager's report. At the end of the year there were developed in the northern section of the mine 559,500 stoping tons of payable ore of an average value of 6.6 dwts. This result we looked on as satisfactory, though in certain directions some disappointment had been met with. Since the beginning of the current year, however, I am glad to inform you there has been a marked improvement in the percentage of payable ground developed. In all four shafts most encouraging results have been met with, and at the end of April the ore reserves stood at 1,241,924 stoping tons of a stoping value of 6.35 dwts., over a width of 50 inches. Assuming that 15 per cent. sorting will be possible, and allowing a suitable figure for mine factor and percentage extraction, it is probable that the recovery will work out at about 28s. per ton milled. We are now using our best endeavours to connect the two southern shafts underground, in order to ensure thorough ventilation for the southern section of the mine before it is necessary to commence stoping there. In the meantime sufficient ventilation is being secured for the development work by means of fans and air conduits underground. The connection of the northern with the southern section of the mine is also being proceeded with, but this will take a longer time to accomplish, as the distance between the two sections is so considerable. The reef plane in the southern section of the mine is by no means as regular as it is in the northern section. The dip is small, and the contours very distorted. This makes it difficult to lay out development to the best advantage at first, but it will not be any great time before considerable knowledge of the lay of the reef is obtained, and the flat dip will tend to make cheap working possible. The erection of the reduction plant is making excellent progress. Owing to the fact that commercial activity in Europe is not so great as it was eighteen months ago, deliveries of machinery and plant are coming forward much more promptly than they did in the case of the Van Ryn Deep equipment, and there is every reason to believe that the mill will be crushing ore before the end of the year. The ore reserves will be quite adequate to supply the 50,000 tons a month, and, unless there is difficulty in obtaining a sufficient labour supply, there is every hope that the mine will have commenced a successful career of production before our next annual meeting. Of course, the plant at present being erected is by no means adequate to the area of your property, but the design is so arranged that the plant can be readily enlarged; and it is the intention to undertake the enlargement as soon as ever the position of the reserves justify it. Our scheme has been to get to the stage of production at the earliest possible date, in order to minimise capital expenditure, and when that stage has been reached our further endeavours will be directed to raising the scale of production to a point commensurate with the great area of your property. I need say little about the financial position of the company as it is fully disclosed in the balance sheet. The funds provided will not be quite adequate to bring the mine to the producing stage; but it is not anticipated that there will be any difficulty in securing such financial help as may be necessary. I now beg to move the adoption of the report and accounts.

Mr. F W. Baxter, in seconding, said: I have much pleasure in seconding the report and accounts. In doing so I think the thanks of shareholders are due to the directors of this company for the very successful manner in which they have practically completed the proving of this company as a payable proposition. Commenting on your statement, sir, that development from all four shafts is in payable ground, I notice that in the south-west shaft every foot of development is payable, the average assay being 78s. value, for nearly 30 inches. As a shareholder with a considerable stake in this company, I am pleased to hear from you, sir, that the mill is likely to be completed and running by the end of the year, and that a tonnage of 50,000 tons per month is to be the initial programme. I understand that the liability of this company at the start of milling will not be a great one, and will be gradually liquidated out of profits. In which case, we hope to see this company entering the dividend stage next year. And later, seeing the good values of development which are being obtained to-day and the good values likely to be encountered, this company's ground being in the best and most payable portion of the far East Rand, that with an expansion of milling plant, shareholders will later receive enhanced dividends for many years to come, for, sir, this is certainly one of the very long-life mines of the Witwatersrand.

In reply to Mr. Baxter, the Chairman reminded them that the company's contract with the Government enabled it to raise money by borrowing money, or by creating a debenture issue. It was too soon to state how the company would be financed. As they would see from the balance sheet there was a substantial amount of money, and they did not anticipate that there would be any considerable shortfall, but the bigger scheme would be taken in hand if the development continued to disclose such satisfactory results as they had been getting during the last few months, and when the bigger scheme was taken in hand no doubt the financial scheme would be formulated and put before the shareholders. At the present moment it was difficult to say when the dividend stage would be entered on.

The report and accounts were adopted.

Mr. S. B. Joel, the retiring director was re-elected

Messrs. Thomas Douglas and E. Danckwerts, the auditors, were re-appointed.

GLENCAIRN MAIN REEF.

Plenty of Low Grade Reef.

Profitable Slimes.

The twenty-first ordinary general meeting of the shareholders in the Glencairn Main Reef Gold Mining Co., Ltd., was held this week in the board-room, Consolidated Buildings. The chair was occupied by Mr. John Munro and among those present were Messrs. C. Marx, P. Richardson, J. F. Rutherford, E. Brayshaw, Woolf Joel, V. J. Ronketti, J. G. Lawn, consulting engineer, and F. Hall, for the secretaries.

The Chairman said: I beg to submit the directors' report and accounts for the year ended the 31st of December, 1913, together with the reports of your consulting engineer and mine manager for the same period. The realised profit of £32,200 15s. 3d. for 1913 is short of that of the previous year by £3,000 odd, due to the falling off in revenue from accumulated slime. The total amount available for distribution, including the amount carried forward from last year, is £36,831 15s. 10d. After providing for profits tax, payments under the Miners' Phthisis Acts, etc., and the payment of a dividend of 5 per cent., an amount of £4,428 18s. 2d. is carried forward to the next account. For the first four months of the current year profits were normal. They amounted to £10,561. The grade of the ore milled was slightly lower than in 1913, but working costs have been further reduced. In April they were below 12s. per ton. At our last annual meeting I pointed out that the payable ore developed was estimated at 205,418 milling tons, in addition to which there was over a million tons of ore of doubtful value exposed in the mine, of which one-half would probably be worked at a profit. During the year under review 240,768 tons were milled, and you will observe from our consulting engineer's estimate that there is still 191,257 milling tons of payable ore in the mine, and nearly 800,000 tons of doubtful value exposed. The payable ore reserves have thus been depleted only to the extent of about 14,000 tons during the year, the "doubtful ore" being largely drawn on to supply the mill. It is hoped that the company will be able to carry on mining operations for some years yet, but this depends on it being possible to maintain a grade of ore higher than the working costs. There is plenty of reef in the mine still, but most of it is exceedingly low grade. The treatment of accumulated slime has been a source of considerable profit to the company, and though all the high grade slime from the early days of the mine has been exhausted there still remains some 300,000 tons of lower grade slime to be treated. The native labour force on your mine has been sufficient during the past year for all requirements. I now beg to move the adoption of the report and accounts.

The retiring directors, Messrs. C. Marx and J. Munro, were re-elected, as also were the auditors, Messrs. Henry Hains and J. P. O'Reilly.

Rose Deep, Limited.

(INCORPORATED IN THE TRANSVAAL.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Eighteenth Ordinary General Meeting of Shareholders for the year ended 31st December, 1913, will be held in the Board Room, The Corner House, Johannesburg, on FRIDAY, 5th JUNE, 1914, at 10.45 a.m., for the following business:—

(1) To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1913, and the Reports of the Directors and Auditors.

(2) To elect Directors in the place of those retiring in accordance with the provisions of the Company's Articles of Association.

(3) To determine the remuneration of the Auditors for the past audit and to appoint Auditors for the ensuing year.

(4) To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under consideration by the Report of the Directors.

The Share Transfer Books of the Company will be closed from the 5th June, 1914, to the 11th June, 1914, both days inclusive.

Holders of Share Warrants who desire to be present or represented at the Meeting shall produce their Share Warrants (or may at their option deposit same) at the places and within the times following:—

(a) At the Head Office of the Company in Johannesburg, at least 24 hours before the time appointed for the holding of the Meeting.

(b) At the London Office of the Company, No. 1, London Wall Buildings, London, E.C., at least 30 days before the time appointed for the holding of the Meeting.

(c) At the Office of the Crédit Mobilier Français, 30 and 32, Rue Taitbout, Paris, at least 30 days before the date appointed for the holding of the Meeting.

and shall otherwise comply with the "Conditions as to the issue of Share Warrants" now in force.

Upon such production or deposit a Certificate, with Proxy Form, will be issued under which such Share Warrant Holders may attend the Meeting, either in person or by Proxy.

By order of the Board

RAND MINES, LIMITED,
Secretaries.
S. C. STEIL,
Joint Secretary.

Head Office:
The Corner House,
Johannesburg, Transvaal.
15th April, 1914.

Geldenhuis Deep, Limited.

(INCORPORATED IN THE TRANSVAAL.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Nineteenth Ordinary General Meeting of Shareholders for the year ended 31st December, 1913, will be held in the Board Room, The Corner House, Johannesburg, on FRIDAY, 5th JUNE, 1914, at 11.30 a.m., for the following business:—

1. To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1913, and the Reports of the Directors and Auditors.
2. To elect Directors in the place of those retiring in accordance with the provisions of the Company's Articles of Association.
3. To determine the remuneration of the Auditors for the past audit and to appoint Auditors for the ensuing year.
4. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under consideration by the Report of the Directors.

The Share Transfer Books of the Company will be closed from the 5th June, 1914, to the 11th June, 1914, both days inclusive.

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(c) At the Office of the Crédit Mobilier Français, 30 and 32, Rue Taitbout, Paris, at least thirty days before the date appointed for the holding of the Meeting.

and shall otherwise comply with the "Conditions as to the issue of Share Warrants" now in force.

Upon such production or deposit a Certificate, with Proxy Form, will be issued, under which such Share Warrant holders may attend the Meeting either in person or by proxy.

By order of the Board,

RAND MINES, LIMITED,
Secretaries.
S. C. STEIL,
Joint Secretary.

Head Office:
The Corner House,
Johannesburg, Transvaal,
15th April, 1914.

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CONTENTS.

PAGE
Notes and News ... 391
Topics of the Week:
  Progress of the National Bank ... 393
  The Year with the Albu Group ... 393
  The Crown Mines Meeting ... 394
  Four Central Mining Subsidiaries ... 394
The Outlook in the Tin Market ... 396
The Crown Mines Circular Shaft ... 397
The Rand's 1914 Gold Output ... 398
The Manager and Staff of the Modder B. Gold Mines, Ltd. ... 399
What's Wrong with Rand Metallurgical Practice? ... 400
A Big Steel Corporation and its Employees ... 401
Mine Models ... 401
Rhodesian Section:
  Latest Mining News ... 402
  Rhodesia's April Mineral Output ... 403
  Rhodesian Geological Survey—III. ... 405
Correspondence and Discussion: "Safety First"; "Discovery versus Re-location" ... 406
Rock Temperatures in the Mines of the Rand—II. ... 407
Engineering Notes and News ... 409
  The Fencing of Machinery—II. ... 409
  Safeguarding the Use of Electricity in Mines ... 411
Finance, Commerce and Industries ... 413
Mining Men and Matters ... 413
The Week in the Sharemarket ... 415
Grade, Costs and Profits in April ... 416
Union Laws Affecting Commercial Travellers ... 417
Company Meetings: Bantjes Consolidated; Modder B.; Crown Mines; Village Deep; Durban Roodepoort; Vogel Deep; Cloverfield; West Rand Consolidated; Cinderella Consolidated; Aurora West; Rand Collieries; Sacke Estates; New Steyn Estates; Roodepoort United; Meyer and Charlton; New Goch ... i.

Notes and News.

The Cam and Motor's Difficulties. There has been considerable uneasiness in Anglo-Rhodesian mining circles in regard to the preliminary returns from the Cam and Motor Company. The output for the period ending with April shows that 17,711 tons were treated for an estimated yield of £24,574, which gives a grade considerably below the estimated average assay value of the ore reserves. The trouble, however, seems to lie essentially with the reduction and treatment works rather than in the mine. The extraction obtained after roasting has been no more than 57·6 per cent. Nevertheless a working profit is being recorded. The slime plant of the company is not at present sufficient to handle the output, and it is impossible to attain the estimated 500 tons per day or to obtain a better extraction, but with some alterations and additions to the plant it is expected that these difficulties can be overcome.

* * * *

Another Oil Subsidiary. It will be remembered that at the meeting of the Consolidated Oil Fields of South Africa, held on the last day of April, references were made to "a very valuable shale proposition," and the Chairman observed that they were proceeding with all possible dispatch "to form a separate company to deal with these properties." The Union Oil Company of South Africa, Ltd., was registered on May 7, in London, after the meeting in question, and the subscribers' names include that Mr. W. W. Macalister, who, by the way, is managing director of the Consolidated Oil Fields of South Africa, Ltd. The managing director of the Consolidated Oil Fields said the other day that the Consolidated Oil Fields "was formed as a promoting company, not as an oil company to develop any particular property, or any proved property, but to investigate the possibilities of oil in South Africa, and when the areas are proved to deal with them as separate companies." The capital of the Union Oil Company is to be limited, at any rate for the time being, to £100. The Consolidated Oil Fields of South Africa, Ltd., originally had a capital of only £100, but the capital was raised to a quarter of a million sterling. The Consolidated Oil Fields of South Africa, Ltd., was registered without articles of association; so is the Union Oil Company of South Africa, Ltd.

* * * *

Mine Officials. We have, in this journal, repeatedly urged upon mine officials the importance of fully qualifying for the highest positions in their respective departments, and it is with pleasure we notice that our advice would appear to be bearing fruit, inasmuch that a keen desire is at present being evinced by officials to obtain their qualifying certificates. We understand that Professor Yates, who for years past has worked so strenuously in this direction, has been compelled by the number of enrolments to provide special accommodation. Apart from the desirability of the staff being in a position to admit of promotion, the knowledge acquired in these specialized courses cannot fail to react beneficially on both the men and the industry.

* * * *

The Rand and World Commerce. Mr. Reyersbach thus referred in mail week to what the Rand gold mines have done for trade and progress:—"I make bold to say that, without the specie basis produced by the Witwatersrand, the development of Canada, the extension of railways on the whole of the American Continent, in Asia, and in other parts of the world, the development of the electrical industry, and the expansion of the coal, iron, steel, copper, shipbuilding, and oil industries at home and abroad would have had to be spread over a considerably longer period than it has actually taken to accomplish what has so far been done, as the world's means would not have sufficed. Even if some sections of the community have been faced with individual direct losses, such losses have been more than compensated through the benefit which the exploitation of the Rand has brought to the world and the consequent development of the financial machineries of States. I believe if this side of the question comes to be even partially realised important sections of the community who at times were only too ready to invest in the securities will begin at least to waver and will, I trust, allow that their spasms of pessimism have been overdone."

* * * *

A Tribute to Rand Survey Methods.

At a meeting of the Institution of Mining and Metallurgy held in London a week or two ago, discussion on the paper entitled "Notes on Mine Survey Records and Calculations," elicited further high praise for the surveying methods adopted on the Witwatersrand. It is interesting to note that a number of prominent past and present Randites, including Dr. F. H. Hatch, the President of the Institution, and Messrs. Rathbone, Whitehouse, and Homersham, took part in the discussion. Mr. Whitehouse, in the course of his remarks, stated that:—

> On the Rand, as the members probably knew, the records were very carefully kept, and probably the work there as a whole compared favourably with that in any part of the world. Everything was referred to a common origin, as had already been mentioned by the President, and of course the whole of the surveys could at any moment be re-plotted from their records, which were carefully preserved. One point had been raised that evening which he could discuss, and that was the question of the keeping of the levels in the drives. The practice nowadays on the Rand generally was not only to carry the survey on up-to-date, but with it, as quite an independent thing, to put in grade pegs a foot above the rail level. Apart from the survey altogether, grade pegs were carried a foot above the rail level along the drive. There was no question of any back work. It was part of the surveyor's work to carry that on from month to month. To those the rails were laid, so that their levels were kept to the grade in which it was decided they should be carried. That was the procedure that he had adopted himself years ago, and the one which he used to-day for all the levels they drove.

* * * *

Selection in Mining.

A large mining and metallurgical corporation, seeking to extend its business, organized a department several years ago, for the special purpose of getting information about new mining properties, examining those that seemed worth while and purchasing those it wanted. A tabulation of the work done and the results achieved by this department are given in the following table:—

	Mines Offered.	Partly Examined.	Measured and Tested.	Bought.
1913	614	100	24	3
1912	694	121	36	4
1911	921	144	28	1
1910	684	124	46	2
Total	2913	489	134	10

Thus only ten properties were purchased in four years out of a choice of nearly 3,000—a sermon on the caution that should be exercised by prospective investors in mining industries'

* * * *

The Life of the Crown Mines.

Not the least interesting of the many important points touched on by Mr. Samuel Evans in his great speech at the Crown Mines meeting on Wednesday was in connection with the life of this property. He stated that since January 1st, 1909, when Mr. G. E. Webber placed the life of the mine at least 50 years, based on a crushing capacity of two million tons per annum, nothing has happened which would lead the directors to doubt the soundness of this estimate. Mr Evans then remarked that during last year the company exhausted thirty-two claims, and in conjunction with this remark it should be noted that company mined 2,483,622 tons during 1913 and milled 2,195,600 tons. Dividing the latter figure by 32 one arrives at a product of 68,612, which, in other words, indicates that the ground worked by the company last year yielded 68,612 tons of milling ore for each claim worked out. There is not sufficient evidence to justify the assumption that this tonnage estimate per claim can be applied to the whole property, but the figures given above seem to imply that a substantially larger tonnage per claim is being, and is likely to be, drawn from the property for some years to come than has hitherto been commonly expected. Past experience has indicated an average of over 60,000 tons per claim in the Crown Deep and old Crown Reef sections, and 70,000 tons or more in the Robinson Central Deep. Near to the outcrop the dip of the reef is steeper than the average between the Crown Deep (now No. 3) and the South Rand (No. 5) shafts. But the estimate of 55,000 milling tons per claim, which has been employed by London students of Rand mining, is certainly being exceeded in actual practice to-day, and in view of the fact that the western section is now opening up so well it would appear not unreasonable to assume that in at least one large portion of this property there is substantially more "pay" ore than has generally been reckoned on.

* * * *

S.W. Africa Co.

The South-West Africa Company, Ltd., which is an Anglo-German enterprise operating in the German territory of South-West Africa, earned £88,566 in 1913. With the balance forward the directors had available £132,056, which permits of the payment of the usual dividend of 5 per cent., absorbing £87,500, while the carry forward is £44,556. The company continues to hold over a million sterling of gilt-edged investments, while the cash in hand is £654,984. So if the concessions fail shareholders have the consolation that their capital is represented by cash and gilt-edged securities, which latter show a depreciation of only £57,000, despite the great depression which has ruled. Having regard to the conditions and the value of the shares in other companies, which is in excess of the amounts at which they stand in the books, the directors are of opinion that it is not necessary to provide for depreciation. The company has continued its policy of selling its land, and has now disposed of half of its 3,250,000 acres. Prospecting operations by means of subsidiary syndicates disclosed nothing of much value during the year, but the Otavi Mines and Railway Company seems to be enjoying marked prosperity.

* * * *

Position of The Sub Nigel.

A report has just been issued by the Sub Nigel, Ltd., for the quarter ended March 31st, 1914, which shows that this mine, which is one of the most interesting of the outlying properties in the Transvaal, earned a profit in that period of £6,675. During the three months there was spent on capital account the sum of £2,407, of which £1,898 were expended on exploratory development. The revenue secured was £28,976, being at the rate of 40s. per ton milled, whilst working costs were just under 31s. per ton. The development carried out on the Nigel Reef was 1,100 feet, the reef width being 10½ inches and the value 26½ dwts. per ton. The 11th east drive at "E" shaft struck dyke and was stopped. A winze is being sunk from this drive to the elevation of the 12th level drive, which is being advanced from "D" shaft so as to effect a connection between "D" and "E" shafts. Driving will be resumed on the west as soon as a box for the delivery of rock has been completed at the bottom of "E" incline shaft. The west drive above the dyke in this shaft is being advanced on low grade but profitable reef. In order to advance development in preparation for the proposed increase in reduction plant capacity to 8,000 tons per month, authorisation has been given for the purchase and erection of a 35-drill air compressor and for the transfer of a boiler from "B" to "C" shaft to augment the supply of power for the running of this compressor, which, it is anticipated, will be put into commission during the month of June. Notwithstanding shortage of native labour the stripping of "C" incline shaft has been proceeded with, in conformity with the proposed hoisting arrangements and preparatory to the sinking of this shaft from the 11th to the 15th level. The Sub Nigel is much better situated in regard to water supply than the Nigel Mine, and we are informed that in so far as this property is concerned no anxiety is at present felt as to requirements for milling purposes.

TOPICS OF THE WEEK.

PROGRESS OF THE NATIONAL BANK.

The National Bank of South Africa has had another excellent year, and the speech made by the Chairman, the Hon. Hugh Crawford, at the annual meeting last week, struck a welcome note of confidence, despite the prevailing gloom. The features of the report are the facts that the last payment for the National Bank of the O.F.S. has now been made, and the excellent returns from all the branches of the National Bank itself, pointing—despite all we hear to the contrary—to satisfactory business conditions throughout the country. For the twelve months ended March 31, 1914, a net result of £411,171 was shown in comparison with £288,255 for the twelve months ended December 31, 1912. This has been arrived at after very careful revision of the assets and making full provision for all estimated and ascertained losses. Out of the profit earned and the balance of £103,194 brought forward, a final dividend at the rate of 6 per cent. per annum is to be paid, and this, with the interim dividend declared on October 3, 1913, absorbs £176,250. It is further proposed that £200,000 be placed to reserve fund, raising it to £700,000, £30,000 to pension fund, and approximately £80,000 in elimination of the balance of the purchase price of the National Bank of the Orange River Colony, leaving a balance of £28,185 to be carried forward to next account—surely a very gratifying result for a difficult and "trying" year. The balance sheet likewise reflects progress under every heading, and the note circulation promises to be substantially increased by the re-introduction of a £1 note issue. Having considered the principal influences affecting the field of operations, and exhaustively reviewed South African commerce and industry in all their phases, the Chairman said: "I venture to think you will agree that there is every reason for satisfaction with the results, and although the commercial horizon in South Africa is not altogether a clear one at the moment, we can, I feel, be confident that the next statement submitted to you will, at any rate, not be unfavourable." With this reasoned expression of confidence in the progress of business, the Chairman very rightly coupled a warning to the fomenters of industrial unrest. He showed that the labour troubles of last year had had a very direct and serious effect upon trade, and it is to be hoped that his words will be taken to heart by those responsible for those troubles and their deplorable aftermath. In this, as in other respects, Mr. Crawford's address can be commended to readers and investors oversea as a sane and dispassionate account of existing business conditions in this country, the causes of their purely temporary dislocation, and their real inherent soundness.

THE YEAR WITH THE ALBU GROUP.

The annual meetings of the Albu subsidiary mines were held too late to be included in our last number, but complete and detailed reports will be found in this issue. Sir George Albu presided at all the meetings, and did not spare himself in his efforts to put the position of each property as clearly as words could express it. Beginning with the Meyer and Charlton, he showed that the position and prospects of the company, as reflected in the accounts and reports for the past financial year, might be described, without the slightest suspicion of exaggeration, as excellent. Good as were the records for the previous year, they have been easily surpassed by the returns for the year under review. In practically every direction an appreciable improvement has been manifested—higher grade and reduced working costs per ton, with resultant increased profits, augmented ore reserves, larger dividend distributions, and an appreciable addition to the cash resources of the company. Very rightly Sir George Albu refrained from dilating further on the excellent position of the company. To do otherwise, he said, would be to gild refined gold. In concluding his review of the New Goch, he showed that the costs for April came out at 11s. 7d. per ton, the lowest reached during the last four years, and he saw no reason why, given normal conditions of labour and work, they should not be kept down to this figure—if not, indeed, brought down still further. "I am hopeful," he added, "that with the continuation of these two encouraging factors—improved grade and lower working costs—your company will in the very near future return to the ranks of dividend payers." At the Roodepoort United, he showed that the two real difficulties with which they had to contend during the last two years have been insufficient tonnage and abnormally low grade. As regards the first of these, it can be overcome if the projected development of the Main Reef in the United section gives reasonably successful results; and the second desideratum is dependent on an improvement—which would not require to be exceptional—in the values of the South Reef now being and to be developed in the lower levels of the Kimberley Roodepoort

> "After all," concluded Sir George, "the chances are, if anything, in our favour. It seems pretty certain that we are not likely to meet with lower grade ore on the average than we have recently been crushing, and there is undoubtedly a distinct possibility that we may encounter better values in depth. I trust, therefore, that on the next occasion of our meeting I shall be in the position of having a more satisfactory task before me in reviewing the operations of your company."

At the West Rand Consolidated, Sir George showed that they had every reason to anticipate that, given a very desirable rest from labour troubles, there will be a further accession to the reserves at the close of the current year.

> "This," he said, "naturally brings me to the question of the expansion of your company's mining operations to a degree more commensurate with the extent of your property than the present intermediate stage. It is obvious from what I have already said that we are keeping this objective in view, but as regards giving any expression of opinion as to when we are likely to be in the position to carry out the necessary additions to the plant and equipment of the mine, I can only repeat the views enunciated by the chairman at the previous annual meeting of your company, that this depends entirely on the results of the large plan of development work which we are at present engaged in carrying into effect."

Sir George was at considerable pains to elucidate the facts regarding the Cinderella and to show how the strike of July had frightened capital. The unfortunate and tantalising position was that records from actual milling results, and the value of the ore reserves, point to the payability of the mine when working under the easier conditions which would be obtained by the completion of the central shaft and the connection of the deep section, in which latter respect most of the spade work has been accomplished. The property is an unusually large one, with huge potentialities, and the equipment is of first-class description. But, because of the lack of the necessary funds required to continue the programme previously laid down for opening up the mine on a scale commensurate with its great extent, it was "for the time being condemned to a period of inaction."

> Sir George added: "It seems to be the fashion nowadays, in these times of depression, to decry deep-level propositions, and to give expression to ultra pessimistic and gloomy forebodings as to the gold contents of the Reef 'petering out' in depth; yet in the lowest level as yet reached in your mine—the sixth on north section reef—at close upon 5,000 feet vertical depth, the last 255 feet driven east assayed 33 dwts. to the ton over a stoping width of 42 inches. Surely it is not a matter of surprise that, with all the encouraging factors which I have mentioned, and bearing in mind also the purely temporary nature of the chief difficulties which we have had to encounter, I am still as firmly convinced as ever of the excellent possibilities of the mine, and I sincerely hope that means may soon be found by which the additional working capital will be raised for proving its value."

A very satisfactory improvement continues to be shown by the Aurora West. Working profits are still increasing, and the prospects are distinctly more encouraging. The position at the Rand Collieries and New Steyn Estate remains unchanged. In the absence of favourable monetary conditions, both though possessed of great potentialities, must perforce remain idle. At the forthcoming annual meeting of the parent company, the General Mining and Finance Corporation, we may expect the lessons of a trying year to be further emphasised and elucidated. To make the position at the various properties of the group clear, nothing, however, can be added to the reports of the proceedings printed in this issue.

The annual report of the parent company shows that no attempt has been made to deal with the depreciation.

Shares and debentures figure in the balance sheet for £1,821,000, which exceeds the market or estimated value by no less than £833,000. The reserve of £140,000 has been written off advances and doubtful debts, these items together amounting to £642,200, as against £802,500 a year ago. "Advances against securities, including stocks and shares taken in," at 31st December last, stood for only £39,400, as compared with £166,800 at the end of 1912. As to the working results of the past session, these are much better than might have been looked for, the surplus amounting to £39,800, or barely £9,000 less than the 1912 sum. But, after writing off £59,140 loss on ventures and adding £30,000 to house property reserve, the credit of £6,000 brought forward is converted into a debit of £43,400. The balance sheet shows cash liabilities £80,400 in excess of the cash assets. As regards the future, the directors state they will spare no effort in the endeavour to place the corporation on a more prosperous footing, but they feel it their duty to point out that the prosperity of the Rand depends to an important extent on the successful working of what are commonly termed lower grade mines. Many of these properties are to-day working at a small margin of profit, which will inevitably disappear if the industry is burdened with an increased scale of working expenditure—whether by reason of additional taxation, industrial upheavals, or other factors. On the other hand, the properties in question would be favourably affected in a corresponding degree by the advent of more economical mechanical appliances, increased efficiency of both white and black labour and a prolonged industrial peace—to an extent, in fact, which would not only permit of these mines making a fair return to shareholders, but would also attract the necessary capital for the active development of large tracts of ground at present lying dormant. The effect of such a restoration of confidence on the corporation, with its large interests in companies holding huge mining areas on the Witwatersrand awaiting active development, would be of far-reaching importance.

THE CROWN MINES MEETING.

In length and wealth of detail, the speech delivered by Mr. Samuel Evans at the Crown Mines meeting was worthy of the size and importance of the great Central Rand amalgamation. The speech is fully reported in this issue, and will be found to cover fully the position of the mine in regard to all vital questions such as grade, "life," working costs and ore reserves, and to contain, in addition, a valuable review of the labour conditions, white and black, that affect the operations of the Crown Mines in common with the rest of the Rand. Mr. Evans supplemented and brought up to date the very detailed information regarding the position contained in the annual reports of the general manager and consulting engineer, recently issued. "Taking everything into account," he said, "I believe that we are justified in considering that last year's results were as satisfactory as could be expected in the circumstances." Turning to the current year, he stated that so far they had not done as well as in the corresponding period of last year. Taking working profits from January to the end of April they have averaged £103,080 per month as against a monthly average of £125,859 in the first four months of 1913. This decrease in the profits is attributable to (1) the shortage of native labour, and (2) the diminution in the yield of the ore stoped from the reserves. Enlarging on these points, he explained that in the first four months of 1913 the company had in service an average of 14,578 natives as compared with an average of 10,846 in the four months ended the 30th of April last, or a reduction of 3,732, equal to 26 per cent. The plants have sufficient capacity to treat over 230,000 tons per month. Now, had the labour supply been sufficient to treat a monthly average of, say, 215,000 tons, the company should have earned from the beginning of the year up to the end of April an additional profit of £96,000, or £24,000 per month. The fall in the grade of the ore which occurred in March and has continued to a lesser extent since is also responsible for a part of the loss of profits compared with the position in the corresponding period of last year. In regard to ore reserves, in the first four months of this year a footage on reef of 1,720 in the eastern and 1,700 in the deep level ground in the western section has been accomplished, and the grade of all the ore exposed, payable and unpayable, is estimated at 6·1 dwts. (25s. 7d.) over 68 inches in the eastern section and 6·8 dwts. (28s. 6d.) over 64 inches in the western section. The ore exposed in the latter section since the beginning of this year is about 1 dwt. higher in value than the grade of the ore reserves of that area at the end of last year. In the past the western section has been looked on as low grade, and the improvement in depth that has recently taken place is a very encouraging feature, particularly when it is borne in mind that the greater portion of the unworked ground is in the western section. Mr. Evans stated that the circular shaft No. 12 in the extreme western end of the property has now attained a depth of 1,869 feet and is 26 feet below the plane of the 13th level main haulage. The station for this level is now completed. The only fault the critics have been able to find with this amalgamation is on the score of working costs, and to this Mr. Evans was able to enter a very convincing *apologia*. He showed that since 1908, the last before the amalgamation took place, there has been a constant shortage of unskilled labour and considerable additions have been made to the costs amounting probably to at least 2s. 6d. per ton. These additions are due to the limitation of underground work to eight hours, which took place in 1911; to increases in wages and recruiting cost of native labourers; to charges in connection with miners' phthisis, including underground water spraying, artificial ventilation, etc.; to sand filling, timbering, rockwalling and other safety measures, and to the modifications effected at various times, particularly in 1911 and since, in the Mining Regulations, necessitating a much heavier expenditure on underground supervision by Europeans. For instance, Mr. Evans pointed out that last year the protection of the underground workings by means of sand filling, timbering, rockwalling, etc., cost £126,000, as compared with less than £30,000 for the separate companies in 1908. Further, in the past two years miners' phthisis has involved a heavy drain on the resources of Rand mining companies. Having indicated some of the inevitable additions to costs which have taken place in the last few years, Mr. Evans demonstrated that on the other hand, largely as a result of the amalgamation, there have been gratifying decreases in the expenditure of certain departments. For instance, the reduction expenses are approximately 1s. per ton lower than they were in 1908; pumping costs are about 1½d. lower; while there is also a saving in the costs of the workshops, of sorting and crushing and of the transport of the ore to the mills. "Had it not been," he declared, "for the unavoidable increases to which I have already referred the costs at present would be about 2s. 6d. per ton lower than they were immediately before the amalgamation. That is, they would be about 13s. 6d., as compared with 16s., the costs in 1908." The weighty words of Mr. Evans on white and native labour questions require no endorsement from us. They carry conviction in every line, and may be commended to all students of Rand economics as the most closely-reasoned exposition, compact of facts, that has been published in regard to the industry for many a long day. In future issues we hope more fully to examine and apply his remarks. It is to be earnestly hoped that our members of Parliament will give these direct and cogent arguments the attention they deserve, and that their clear message may be rightly interpreted by the Government and the people of South Africa. Mr. Evans' diagnosis of our white labour troubles is penetrating, merciless, and—to many—doubtless unpalatable. But time, we believe, is bound to prove him right.

FOUR CENTRAL MINING SUBSIDIARIES

Apart from the Crown Mines, which company is dealt with in another column, four subsidiaries of the Central Mining and Investment Corporation held their annual meetings on Tuesday and Wednesday. At all of them most satisfactory statements were laid before the shareholders, and had it not been for the labour troubles, even better results would have been shown. Full reports of the proceedings will be found in this issue, but some of the salient features may be emphasised here. At the Modderfontein B. meeting the Chairman, Mr. R. W. Schumacher, was in a position to point with justifiable pride to the excellent results achieved. He called attention to the fact that, after paying dividends and meeting other expenditure, the financial position of the company was improved by over £75,000 during 1913, and that in addition there was a substantial increase in the quantity and value of the ore reserves. Mr. Schumacher may well claim that the management has no need to offer excuses for the grade of the ore worked in 1913, or for the grade of the reserves that remain at the end of that period. "We are asked from time to time," said the Chairman in conclusion, "about the general prospects of the company—how long are the present profits likely to continue, and what dividends can be expected. In reply, I can only let you have a general expression of opinion based on the knowledge we have to-day, which is limited by the existing development and by the stope faces. As far as we can see to-day the results that have been obtained during the first few months of 1914 appear to be normal and indicative of what may be expected under reasonably favourable conditions from the present ore reserves. In other words, we see no reason at present why we should not continue to earn profits that will average in the neighbourhood of £1 per ton milled without mining above the average grade of the ore reserves. In a couple of years or so, when a good deal more development will have been done, it should be possible to speak with greater knowledge on this subject."

The position at the Bantjes, as reviewed by Mr. F. Raleigh, who presided in the absence of Mr. E. A. Wallers, is improving In closing his remarks on the results for last year, Mr. Raleigh showed that the profits for March and April of this year averaged £3,700 per month, the total profit for the four months ending April being £10,100. The board has every hope that the results of the last two months will be maintained, and even improved on. The mine is, however, so much dependent on an adequate supply of native labour for hand-drilling in stopes that it is impossible to forecast results in view of the unknown quantity of labour which the manager will have at his disposal for the balance of the year. The management do not anticipate any further capital expenditure during the current year. Mr. Raleigh added that a communication has been received from a shareholder complaining that the costs are too high and the profit low, and stating that the directors should give the matter of their improvement serious consideration. "In reply," Mr. Raleigh said, "the low profit is a disappointment to your board, and I think I have shown you that this is due to the reduced grade of ore, and that the decrease of profit of 1913 below that of 1912 would probably have been made good by increased tonnage and reduction of working costs in 1913 but for the July strike and consequent loss of native labour. There has been a satisfactory reduction in the working costs, and it is hoped that they will further be reduced during the current year." The prospects would, therefore, seem to be bound up with the native labour supply, and the mine is putting up a good fight against its difficulties.

Of a highly favourable nature, likewise, was the speech made by Mr. R. W. Schumacher from the chair at the Village Deep meeting. Development is well ahead of the requirements of the mill, and it is satisfactory to note that the values disclosed in the lowest workings are quite normal and encouraging. "There is in our mine," said Mr Schumacher, "no indication of any depreciation of ore values in depth. Figures quoted by the Chairman showed the values exposed at a vertical depth in the neighbourhood of 2,500 feet, and at a vertical depth of slightly over 4,000 feet. It is most interesting to notice how well the values are maintained to the very bottom of the mine. Summing up, Mr. Schumacher said: "The mine to-day is in a stronger position than it ever has been before. The ore reserve is large, there are ample stope faces, the mine is working without undue strain, and can with the present labour easily produce monthly the full requirements of the mill. It is of importance also that the heavy capital expenditure, which has reduced our dividends during recent years, is now coming to an end. We have before us in 1914 barely £25,000 to meet, and probably under £20,000 in 1915. Dividends to shareholders should, therefore, be increased in the near future."

Mr. H. Eckstein presided at the annual meeting of the Durban Roodepoort Deep, and gave a very clear and concise account of the position and improved prospects. He showed that the policy was to push the opening up of the big undeveloped area south of the present workings so as to maintain or still further strengthen the ore reserves. If there are no disappointments in regard to labour, this work should now make steady and satisfactory progress, as the main difficulties, namely, shaft and water troubles, have been practically overcome. Such expenditure as may have to be faced for shaft sinking and development will be met out of the development charge to working costs. No detailed estimates of the expenditure on capital account which will have to be incurred during the next few years in connection with the development scheme have been prepared as yet; in any case no items of importance will need to be considered immediately. "If nothing unforeseen happens," added Mr. Eckstein, "recent monthly results should now be improved on in regard to tonnage milled, yield and working costs. Our ore reserves have been well maintained. Our financial position has been greatly improved, in that a deficit of £4,406 at the end of 1912 has been converted into a surplus of £23,780 at the 31st of December, 1913. I think I may safely say that the outlook generally is decidedly encouraging." Of these four important mines of the Corner House control, it may therefore safely be said that in the absence of further labour troubles all should do substantially better in 1914 than in 1913.

Transvaal Estates and Development.

The report of the Transvaal Estates and Development Co., Ltd., submitted to the meeting on the 15th inst., for the year ended 31st December last, expresses regret that in consequence of office changes in Johannesburg it has not been found possible to issue the annual report to shareholders until a later date than in previous years. The main items of income and expenditure in the accounts now presented exhibit no material difference from the corresponding figures in the accounts for 1912. The events of the year were, however, of such a character as to render necessary further and considerable provision against the depreciation of investments. An appropriation has also been made for the purpose of covering the depreciation of value in estates improvements, while an additional sum has been set aside against losses which may be expected to result from the failure of tenants to whom advances have been made to fulfil the obligations into which they have entered. Over and above the usual depreciation in the value of the movable assets on the several estates that are being developed under direct administration it has been thought advisable, in view of the stage that has now been reached, to write off the balance of the deficit accumulated in the working accounts of these estates since the several operations began. The net result of these necessary appropriations is that the credit balance brought forward from last account has been reduced by £21,630. The farms sold by the company during the year were as follows:—Schoonoord 91 (south portion), £3,000; Zondagsfontein 123 (eastern portion), £6,127; Mooiplaats 128, £1,100. Of these sums £155 has been allocated to profit and the remainder applied to the reduction of the book value of the estates. In the whole of the above sales mineral values have been reserved. Sales of land have no doubt been prejudiced, both in numbers and in price, by the adverse conditions to which reference has been made While drilling for water in the northern part of the Roodekuil estate a seam of coal was lately encountered which may prove to be valuable when commercial conditions admit of its exploitation. Beyond this and the discovery of a reef of uncertain auriferous value on the farm Hebron, in the Lydenburg district, nothing of interest in this direction has occurred on any of the company's properties since directors made their last report.

THE OUTLOOK IN THE TIN MARKET.

Transvaal Production Statistics—The Serious Fall in the Price of the Metal.

On Tuesday tin was quoted on the London Metal Exchange at £138 for cash, £139 15s. for three months' delivery. This is the lowest point seen since February, 1910, when the era of high prices may be said to have made its definite start, and the continued fall in the selling price raises the question of whether a further decline is to be expected, and what movements the near future is likely to witness. It is, of course, hardly necessary to say that the sustained drop in price is causing local tin mining companies, in common with tin mining concerns in other parts of the world, much anxiety, and unless the riot of decline in selling price is stemmed, it is not unlikely that the effect will be to curtail production in the Transvaal.

THE OLIFANT'S RIVER AREA.

At any rate the decline means restriction of profits and imposes a very severe handicap on prospective new properties in the Olifant's River region, where a considerable amount of ore has been stacked at surface or has been blocked out underground in preparation for milling operations. The majority of these Olifant's River mines are patchy, but contain high-grade zones of limited size. A few months ago it was predicted that considerable activity would be observable in this region during the current dry season, but the marked fall in the price of tin during the past few months has naturally depreciated the value of the tonnages stacked for treatment or developed underground, so much so that in the case of some propositions the margin of profit in sight a few months ago has almost entirely disappeared. From all we can learn, no great measure of activity is to be noticed in the Olifant's River area to-day; indeed, several properties considered promising a few months ago have suspended operations and these mines are likely to remain idle, unless an improvement in the price of the metal is registered.

FALLING OFF IN THE CLAIMS.

One consequence of the decline in the price of tin is specially noticable in the statistics of prospecting permits and claims held in the Transvaal at different dates, given by the Mines Department in their monthly returns. In the figures supplied by that Department as to claims held, the largest diminution in holdings is to be noticed in regard to base metals, particularly in the Pietersburg District. A year ago 54,190 claims were held. At December 31, 1913, the number had fallen to 43,229 whilst at April 30th, 1914, the number was 37,127. These claims are, for the majority, cassiterite holdings and there can be no doubt that the substantial falling away reflected in the above figures has largely been due to falling off in the price of tin.

PRODUCTION STATISTICS IN THE TRANSVAAL.

At this juncture it will be interesting to note the statistics of output in the Transvaal Province, which show clearly how the fall in the selling price of the metal has affected the total value of the output.

	Tin	
	Tons	Value
June to December, 1910	1,766.500	£175,718
Year, 1911	3,525.615	410,818
Year, 1912	2,932.208	367,699
Year, 1913	3,600.494	427,863
1914—	Tin	
	Tons	Value
January	366.557	£38,613
February	331.880	34,056
March	355.067	34,492

THE OUTLOOK.

What are the prospects of an improvement in the price of tin in the near future? According to London authorities a continuation of cheap money seems likely, and this belief is, no doubt, partly responsible for the idea that reaction has gone far enough. With tin at its present low price it should be worth while glancing briefly at London Metal Market statistics and to endeavour to see if they point to any definite conclusions.

In the first place, it is worth noting that the April statistics showed a drop of about 1,500 tons in supplies, while the March statistics, allowing for that month containing the Banka sales, were substantially lower than in February. Some allowance must be made for the Straits output being lighter in the early months of the year, and for the American shipments being then usually at their heaviest. Still, without wishing to lay too much stress upon the fact, the position, so far as monthly statistics are concerned, has improved recently. When we turn to consider the output of individual countries, it is clear that the rate of output for the first four months of the year is in excess of that in 1913. After allowing for the usual additions to the preliminary returns from the Federated Malay States, it will be seen that they are up about 13,000 pikuls, or say 774 tons. This excess is more than covered by the January return, which, of course, practically belongs to the past year owing to the Chinese New Year occurring in February. Since that time the returns have not shown very much divergence from those of the corresponding months of last year, one can hardly expect to see any increase on the returns of 1913 so long as prices remain where they are. On the other hand, it must be remembered that the coolies do not readily leave the mines, and for a time at least lower prices generally mean that more labour is expended in the effort to neutralise the fall. Probably, however, the fall in prices will be felt more quickly than in earlier years, as it is the general opinion that the increase in production in the last four years has been obtained from poorer ground, and that a drop of £80 in the price of the metal from the high level of a year ago must exercise its influence more rapidly than has been the case with previous declines. But the well-informed London authorities seem to think that at the moment it is not reasonable to reckon on any substantial production. As to China, latest reports point to the fact that revolts and rebellions should dispose of the expectations of any forthcoming increases.

BOLIVIA AND NIGERIA'S INCREASING SHIPMENTS.

The imports of ore into the United Kingdom for the first quarter show an increase, which indicates that Nigeria and Bolivia are still increasing their shipments. The increase is at a rate which would represent about 4,000 tons more tin to be received in the United Kingdom than last year, but this figure is conditional on several assumptions. The actual output for Bolivia last year is not yet known. Dealing with this aspect of the tin market, the *Mining Journal*, of London, remarks:—"As was shown in our issue of January 31, the first six months' output increased by some 2,200 tons of metal, or at the rate of 4,400 tons on the year and the increased shipments to this country in the current year partially represent metal won towards the end of last year. We have recently had the opportunity of discussing the position in Bolivia with engineers possessing an extensive knowledge of the conditions, and find a general agreement as to the difficulty of increasing output owing to the limitations of possible labour. Of course, this is no new complaint in the country, and steps are gradually being taken to supplement hand labour by mechanical power. In important cases, however, we gather that considerable development work is necessary in view of the new plant to be installed, and this, taken in conjunction with the low prices now ruling, may result in the Bolivian output remaining at about last year's level. One of the features of the year so far has been the heavy increase in the arrivals from Nigeria. The first quarter's receipts here were 2,331 tons of ore, as against 1,192 tons in the corresponding period of last year. In the regrettable absence of any official statistics of output, these arrivals will probably be variously interpreted. Some people may see in them the full measure of increase for the year which they suggest at first sight. Others believe them to represent accumulations shipped out after the close of the wet season; while yet another explanation offered is that all available ore has been got out of the country in fear that the royalty on tin is to be raised 50 per cent. Anyhow, 1,000 to 1,500 tons seem to be the extremes of increase anticipated for the current year. Considering the various sources of supply and avoiding extremes of opinion, it certainly appears as if the supplies of tin during the next few months, at any rate, would be at least equal to the corresponding period of 1913, when production was advancing more rapidly than consumption.

Consumption appears better than when we last wrote, though the only department in which it can be gauged readily is the tinplate trade. The shipments to the United States for the current four months were roughly 15,650 tons, as against 17,682 tons in the previous year; it is, however, believed that the output of tinplate in the first three months constituted a record. At home exports showed a considerable gain for April, and total 170,067 tons, against 163,095 tons last year. In other branches of trade consumption can only be gauged as a reflection of general trade activity. This is generally accepted as poor, though there appears to be an impression, at any rate so far as concerns the iron and steel trades of the United States, that it is not so bad as has been made out, and the 65 or 70 per cent. of the full output has been maintained. Whether in the absence of complications in political affairs either at home or abroad trade and business, assisted by easier monetary conditions, are going to broaden out is the enigma which everybody has been seeking to solve for some time, and on the answer given to it a good deal of the future outlook, not only of tin but all the metals, depends. At the beginning of the year we expressed a strong opinion that we must look to business sentiment rather than to the statistical position in forming an opinion whether metal prices were likely to rise or the reverse. A 3 per cent. Bank rate will encourage speculation in the metal, and the fact that there has been so heavy a fall naturally gives ground for belief that a rise should be once more due. At the same time, until there is evidence of a considerably brisker demand than is assured at present, the statistics suggest that a sustained rise will have a good deal to contend against."

THE CROWN MINES CIRCULAR SHAFT.

Excellent Rate of Sinking—Low Cost of the Work—Thorough Ventilation of the Western Section Provided For.

The No. 12, or circular, shaft on the Crown Mines property has now reached a depth of 1,869 feet and is 26 feet below the plane of the 13th main level haulage. This shaft will be sunk to the plane of the 16th level, when it will have a total depth from surface of 2,500 feet, so that at the present time a little over 600 feet remains to be sunk. Excellent progress has been made. At the end of January a depth of 1,202 feet had been reached and the footage sunk during the month, despite a loss of four shifts on account of the strike, was 189 feet—a very creditable achievement. In the preceding month 187 feet were sunk, whilst the footage for November was 217. The November sinking, we believe, constituted a record for a circular shaft, and has only been exceeded by one or two rectangular pits. The shaft in question is located on the extreme western section of the Crown Mines, and is being sunk with the object of improving ventilation in that area of the property. The shaft is of circular type, and is 18 feet in diameter.

Good Rate of Progress.

Since the end of January 667 feet have been sunk, or an average of 167 feet per month, so that at this rate the shaft should reach the plane of the 16th level at 2,500 feet from surface in about 3½ months' time. When it was decided to sink this shaft in order to better ventilation conditions in the western section of the Crown Mines property, it was not at first suggested that sinking should be continued below 2,000 feet, and reckoning on an average sinking rate of 150 feet per month, it was expected that the conglomerate beds would be intersected in thirteen or fourteen months after the commencement of sinking operations. As will be seen from the above this rate has been substantially exceeded in actual practice.

Cost of Sinking.

The Crown Mines sinking achievement has been remarkably good both as regards rate and cost. It will be recalled that the practice of sinking circular shafts which prevailed in the earlier days of the Witwatersrand, notably on some of the mines under the control of the Johannesburg Consolidated Investment Company, dropped out of fashion for some years, but was revived under the aegis of Mr. H. Stuart Martin at the New Modderfontein mine early in 1911. At the New Modderfontein sinking was started on January 2nd, 1911, the reef was cut on October 29th, 1912, and shaft sinking was stopped November 16th, 1912, the shaft then being 2,258 feet deep. Sinking and walling therefore took place over 22½ months, or at an average monthly speed of almost exactly 100 feet—walling and sinking being done alternately. The cost of sinking averaged £14 9s. 5d. per foot, and of bricking £7 12s. 2d. per foot, or a total of £22 1s. 7d. per foot. The total cost of the surface equipment, exclusive of quarters, amounted to £30,077. At the time sinking was commenced at the Crown Mines we stated that at the Crown Mines a higher rate of sinking than was attained at the New Modder was anticipated, and that this should conduce towards further economy in sinking. In any case, the sinking costs of the New Modderfontein Company were considered as being highly satisfactory and the general results secured induced us to predict that such other new shafts as were called for on the Witwatersrand—some of them, at any rate—would be of circular rather than of rectangular shape. The Crown Mines Company and the City Deep have since fulfilled these predictions.

At the Crown Mines the cost of sinking up to the end of April had been £38,031, or £21 11s. 5d. per foot, including everything. The cost per foot excluding surface equipment was £15 1s. 6d. It will be seen that our anticipation that the rate of sinking at the Crown Mines would exceed that at the New Modderfontein, whilst the cost would be less, has been borne out in actual practice.

Establishing Connections.

When the work on this shaft has been completed and it is connected up with the rest of the underground workings the company will have made thorough provision for the effective ventilation of the western end of the mine and will be in a position to push ahead rapidly with the development of that area. At the end of April last the 13th level had been advanced 3,000 feet west of No. 7 shaft and was then 2,700 feet off the new circular shaft. Connection, it is hoped, will be effected about April of next year. The 16th main haulage level has been advanced 1,455 feet west of No. 5 shaft. The new circular shaft when it is completed and when it has been connected with the main haulage levels which are now being driven towards it should complete the main outlines of the policy of development which the management of the Crown Mines has laboured so strenuously at for the past few years, is so far as the more northern section of this great property is concerned.

THE RAND'S 1914 GOLD OUTPUT.

Decrease on 1913 Total Improbable—Excellent Return for May Anticipated—The Main Reef Series and the Production of the World.

THE Rand, despite its many troubles, is still pre-eminently the leading gold field of the world, and notwithstanding the many depressing prophecies to the contrary, we believe that it is likely to maintain this position for a good number of year to come. It is probable that at the present day the Main Reef series is yielding 6s. 8d. out of every sovereign's worth of gold produced in the whole world, and it seems more than likely that this liberal proportion will at least be maintained for a very considerable period. With the possible exception of the Pis-Pis gold fields in Nicaragua, which are now engaging the attention of European capitalists, no new auriferous areas appear to be looming very largely in the foreground. As to old fields the outlook for any substantial expansion, save in the cases of the Rand and Southern Rhodesia, which latter country, by the way, will probably announce an output for the current year 50 per cent. in excess of the 1913 total, is not at all good. Some time ago it was freely predicted in America and elsewhere by mining engineers of authority that the Rand would soon show signs of decline. The lesser outputs recently recorded have no doubt been regarded by these critics as verifying these predictions, but it should be realised that extraordinary labour difficulties rather than anything else have been responsible for curtailment of operations. The Reef now appears to be regaining some of its lost ground and a few figures regarding the output for the first four months of this year in comparison with those for 1913 should here prove of some interest.

THIS YEAR'S RETURNS.

According to the Government Mines Department statistics, outputs for the first four months of this year have been:—January, £2,642,495; February, £2,538,842; March, £2,790,940; April, £2,793,255; total £10,765,532. This gives an average of £2,691,383 per month. Assuming that this rate of monthly average is continued throughout the current year, the 1914 gold harvest will be worth £32,296,596, or, say, in round figures £32,300,000. Such a return would fall approximately £1,800,000 behind the output of 1912 and £3,500,000 below that of last year. Assuming, however, that the rate of output announced in respect of April may be taken as the average for the year, the 1914 output would be worth £33,519,060, which would still be over two millions sterling short of the output for the preceding twelve months. In 1912 the output was worth £37,091,050, or an average of £3,090,921, and in 1913 £35,786,917, or an average of £2,982,243 per month.

MAY'S GOOD YIELDS.

As a matter of fact it is probable that the current year's gold harvest will show a return substantially in excess of that which might be arrived at by estimating twelve months' yield on the basis of the April output. The return to be declared on Wednesday in respect of the May operations is likely to constitute a very substantial increase on the output of any preceding month this year. The majority of the mines achieved excellent results last month. There was, of course, one more working day, but quite apart from this labour, so we understand, has been coming in more freely. It is anticipated that most of the groups will announce much better returns for May than for April. Particularly is this likely to be so in the case of the properties controlled by the Central Mining and Investment Corporation. We understand that the New Modderfontein, Modderfontein B. and City Deep, amongst other mines, did particularly well last month, and that their returns and profits for May will be announced at figures substantially in excess of the April earnings. Provided no further serious labour trouble takes place, either in regard to shortage of coloured labour or industrial revolt amongst the white workers, it does not appear improbable that before the end of the year the mines of the Main Reef series should again be working up to an output of three millions a month, which would make the output at the rate of thirty-six millions per annum, or slightly more than the production for last year. It is noticeable that the maximum rate of crushing attained in the first four months of this year was at the rate of twenty-five million tons per annum, which it should be noted is three million tons below the estimate of twenty-eight million tons per year referred to in the famous Chamber of Mines estimate to the Economic Commission. Such a rate of milling, it should be noted, has never yet been attained, the largest amount of ore crushed in any one year being 25,728,165 tons in 1913. Considered in this light, therefore, the Chamber of Mines' statistics, which, be it noted, referred to producing mines only, are not nearly of such depressing character as some have interpreted them to be. In other words, the evidence in this regard may be likened to a man in pessimistic mood declaring that he cannot see any hope of his annual income being maintained at over £1,000 after five years have elapsed, this man never yet having earned £900 per year. Admitted that some of the older properties of the Witwatersrand, such as the May Consolidated, are well-nigh at the end of their respective tethers, the outlook for an increased output in the not far distant future is very good provided no further labour disturbances take place. The Government Areas and Modder Deep Levels will commence production in a few months' time, and in addition to the substantial outputs which these important mines are certain to register, it must not be overlooked that a large number of the newer productive ventures are capable of considerably augmenting their returns. Predictions are usually dangerous and unsatisfactory, particularly so when applied to such a kaleidoscopic industry as the Witwatersrand. But without indulging in any deep or hard and fast prophecy we feel justified in making the statement that the returns for the current year will be little if anything below that for 1913. It is, in fact, by no means improbable that the 1914 output will constitute an appreciable advance on the production of the preceding twelve months.

The Albu Group.

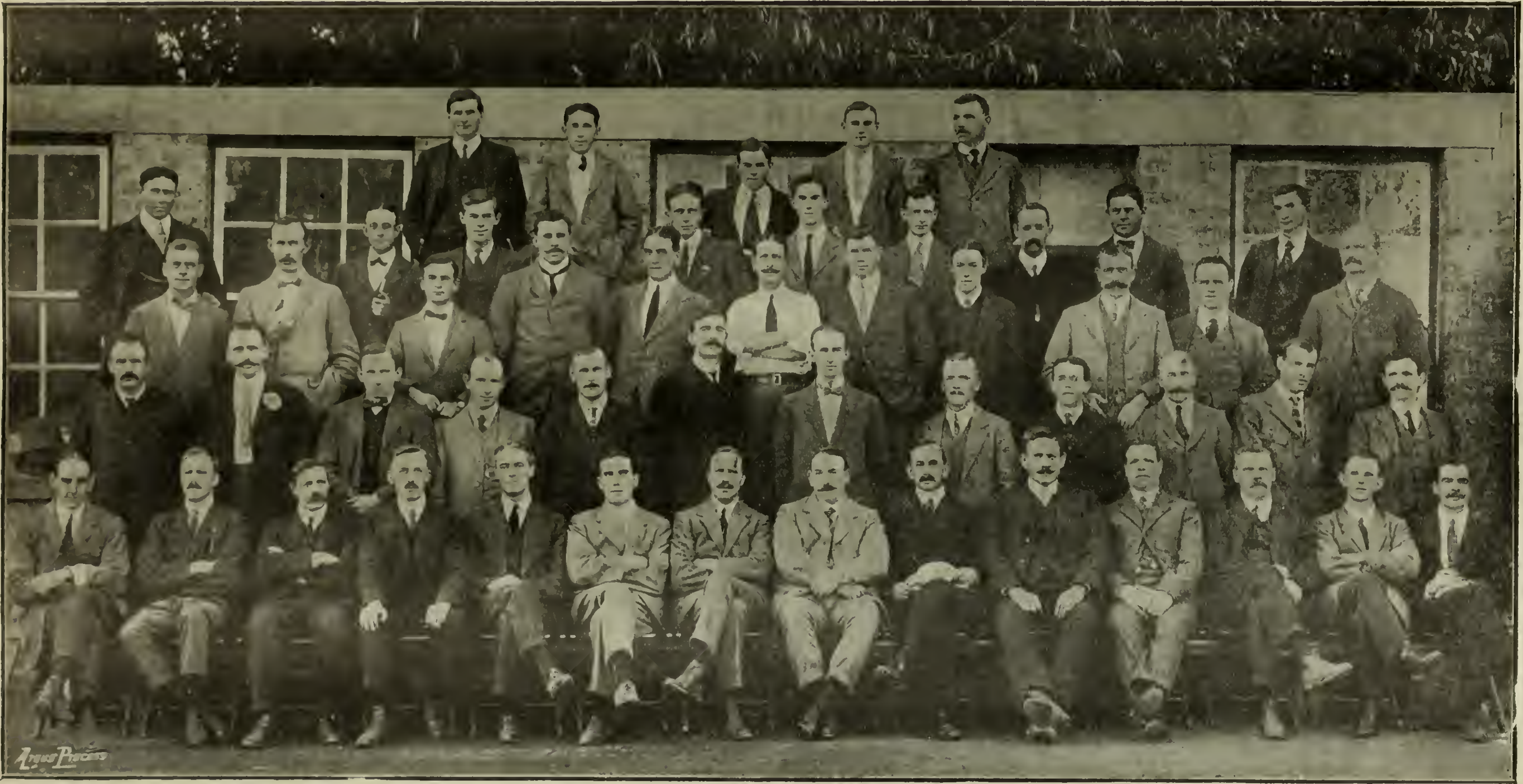
The following are the details of results regarding the May operations of the producing mines of the General Mining and Finance Corporation Group:—

Company.	Stamps.	Tons Crushed.	Total Cost.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	80	14,920	£13,495	18/1·1	£18,182	£1,687
Meyer and Charlton	75	14,950	12,688	16/11·7	35,015	22,327
New Goch	120	30,700	21,949	14/3·6	32,631	10,685
Roodepoort United	55	24,600	21,972	17/10·4	23,276	1,304
Van Ryn	140	39,600	30,836	15/6·9	53,184	22,648
West Rand Consolidated	100	26,800	26,921	20/1·1	34,058	7,134
	570	151,570	£127,861		£196,619	£68,785

Blaauwbosch Diamonds

The washing returns of this company for May, 1914, are as follows:—Blue ground washed, 8,558 loads; recovered, 1,815 carats, or 21·20 carats per 100 loads.

THE MANAGER AND STAFF OF THE MODDER B. GOLD MINES, LTD.



Front Row (from left to right): C. W. Thompson, chief storekeeper; G. S. Butlin, head surveyor; J. T. Hird, assistant engineer; J. Peel Nelson, electrical engineer; F. W. Parker, mine secretary; J. Dingwall, mine captain; C. L. Butlin, manager; E. H. Woodman, chief engineer; A. N. Locke, reduction officer; T. Cook, compound manager; W. Stewart, mine captain; A. Fraser, assayer; R. P. Thomson, shiftboss; J. E. Stone, foreman fitter.

Second Row: T. Downham, shiftboss; J. Benson, mine captain's clerk; G. Watkins, shiftboss; G. McLean, shiftboss; A. Jenkins, shiftboss; R. R. Reed, native inspector; C. L. Ogilvie, European timekeeper; R. C. Anderson, cyanide foreman; S. Curnow, assistant assayer; E. A. Barry, smelter; W. E. Sneyd, engineer's clerk; T. C. Jarvis, foreman electrician.

Third Row: G. A. McAllan, native timekeeper; H. V. Batten, head sampler; C. N. Davies, assistant surveyor; A. S. E. Corbett, assistant surveyor; A. Rigney, assistant surveyor; J. H. Symonds, caretaker; A. E. Bird, paymaster; B. O. Smith, assistant assayer; J. McLean, foreman smith; S. Evans, draughtsman; J. Downie, mill foreman.

Fourth Row: A. de Greeff, shiftboss; H. Higginson, hospital superintendent; H. Imrie, assistant native timekeeper; L. F. Stride, assistant mine secretary; W. H. Ogilvie, clerk; A. H. Brockett, assistant storekeeper; D. Evans, foreman carpenter; R. R. Wiggett, assistant native timekeeper; E. Games, shiftboss.

Back Row: S. Booth, mine captain's clerk; C. T. Messum, shiftboss; B. I. Brown, assistant native timekeeper; F. W. Isaac, assistant native timekeeper; J. M. Walker, typist.

Olliver, Photo.

WHAT'S WRONG WITH RAND METALLURGICAL PRACTICE.

Mr. F. L. Bosqui, in a Spirited Reply to Mr. H. S. Denny, Emphatically Answers "Nothing!"

In the current issue of the *Mining and Scientific Press*, of California, Mr. F. L. Bosqui, consulting metallurgist of the Central Mining and Investment Corporation, writes:—

H. S. Denny's article, "The Decline of the Rand," which appeared in your issue of January 3rd, contains the following:—"The Rand, since the introduction of the cyanide process in the early days, has done practically nothing to add to the glory of engineering achievements. It has, rather, followed a policy of sticking to the one old principle and developing the details of that principle to the last limit. In my opinion, and I share this with a great many other engineers, the Rand might have saved itself a large amount of capital outlay if it had adopted, immediately after the war, for the treatment of its unusually simple clean ores, what has been accepted all the world over in the past ten years, namely, the one-product one-treatment method." Mr. Denny's opinions may be shared, as he asserts, "by a great many other engineers," but I venture to say, on equally good authority that there are many engineers and metallurgists of good repute who do not share them. Mr. Denny's is not a novel or an especially disturbing point of view. He is simply reiterating a somewhat time-worn sentiment—I use the word advisedly—which so long as the Rand continues to exist as a mining field, will make its perennial appeal to metallurgical faddists and extremists the world over, and encourage machinery men and inventors to hope for better times. Popular fallacies die hard: but none seems to exhibit a more enduring vitality than the belief that there is something radically wrong with Rand metallurgical practice. One might suppose, after reading this oracular utterance from overseas, that the metallurgists and engineers of the Rand had resolved themselves into a kind of close corporation for the exclusive purpose of nursing and perpetuating obsolete ideas, and jealously opposing the intrusion of up-to-date principles and methods. Even if this were true, it is difficult to see how Mr. Denny's remedy would have helped the industry. In his opinion, all would have been well if the Rand "had adopted, immediately after the war, for the treatment of its unusually simple clean ores, what has been accepted all the world over in the past ten years, namely, the one-product one-treatment method." This method (by which I understand the writer to mean the reduction of ore to one product and its treatment as such) has not been adopted on the Rand for the simple reason that nothing would be gained by using it. As a pioneer in the introduction of "all-sliming" in Nevada in 1905, and a strong advocate of its adoption in certain isolated cases where it was applicable, I came to the Rand greatly impressed by its advantages. But I was soon to be impressed in a different way: I was astonished at the effectiveness and low cost of methods which I had come to look upon as old-fashioned or obsolescent. The huge slime and sand plants spread over acres of ground certainly did lack the neat and desirable compactness of the modern all-sliming plant. Here, at first glance, appeared a most alluring field for the ambitious innovator. It seemed a tempting opportunity to introduce the latest and newest thing with which one was familiar: in other words, to revolutionise Rand practice and become famous! But I must confess that my ardour soon evaporated in the light of incontestable facts. I could not see that anything was to be gained by "all-sliming," or by any other radical sweeping change in local practice. Indeed, the arguments against all-sliming on this field at the present time are irrefutable. The total extraction being what it is—ranging from 94 per cent. in the older plants to 97 per cent. in the newer—could only be very slightly increased by fine grinding or sliming the sand, since the coarse sand is the poorest product in the plate residue, and the cost of regrinding this material, as experiments have conclusively shown, would leave an exceedingly problematical net gain. Mr. Denny's allusion to capital expenditure does not apply to the plants of more recent construction, where the amortisation of initial cost is by no means the serious item he imagines. And even supposing it were, the "one-product, one-treatment method" would hardly appeal to the practical man as an effective remedy. An all-sliming plant on this field, with the huge tube-mill and filtering additions required, would be an extremely expensive installation. Without recourse to a comparative estimate, it is obviously impossible that the mere elimination of sand plant should offset the cost of the additional fine-grinding and filtering equipment required.

The survival of the old system of separate sand and slime treatment on the Rand is easily explained; it has persisted because it is so admirably adapted to the unique local conditions. At all events, nothing better has been found to take its place. Yet in spite of this safe conservatism, which critics often mistake for stagnation, the metallurgy of the Rand has in recent years made solid and distinct progress. The introduction of tube-mills, heavy stamps, vacuum-filtration, and air-lift agitation, are notable among a host of lesser innovations; but it is significant that every deliberate attempt to effect radical changes in our metallurgical system has met with disastrous failure. This is not due, as is popularly supposed, to any niggardly or obstructive policy on the part of the mining houses. Vast sums have been willingly spent on fanciful installations and processes which have lamentably failed, and it is only fair to those companies who have suffered through their amiable credulity, to state that their attitude, in the face of overwhelming losses, has usually been most patient and generous. I venture to say that at the present time there is no mining field in the world where more enthusiastic interest is evinced in innovations of real value. But the Rand mining companies, after many costly experiences, have become wary; like the Missourian, they must be "shown."

National Diamonds.

The secretary supplies the following particulars of loads washed and diamonds recovered at the National Diamond Mine during the months February to May, 1914, inclusive:

	Hauled.	Washed.	Carats.	Average per 100 Loads.
February	7,962	6,777	507¾	7·4
March	9,217	7,837	637	8·1
April	6,513	5,538	429½	7·7
May	9,451	8,143	705¾	8·6
	33,143	28,295	2,280	8·067

The No. 2 mine is at present being worked and is opening up very satisfactorily, and the manager anticipates being able to wash an increasing quantity of clean ground month by month as the second level is opened up. Only a small percentage of ground has been available from this level hitherto. Both the average yield and the quality of the diamonds recovered show a satisfactory improvement from the second level. The faces at this level are gradually extending and the manager anticipates that something like fifty per cent. of the ground required will be available from this source by the end of June, as against less than ten per cent. for May. Great difficulty and consequent delay has been experienced in getting the new gear to work, breakdowns of certain parts have been frequent and were for a time very disheartening to the directors. These difficulties have now been overcome, and the manager reports under date June 1st as follows:—"The machinery ran fairly well during the week, all three pans working." The directors now anticipate that with the plant running smoothly and more clean ground becoming available that the present and subsequent months will show substantial increases in the yield of diamonds of better quality and also an improved average per 100 loads treated. It is expected that the quantity of ground treated this month will exceed 15,000 loads."

Sakalava Madagascar Proprietary Oil Fields.

The secretary of the company writes:—We have this day received cable advice from Tananarive, Madagascar, viz.:—That Mr. S. A. R. Skertchly, the company's field engineer and geologist, has arrived at the Marohaola drilling site together with four drillers. That the transport of the big machine (3,000 ft.) is well in hand and has reached Ampilipih, which is some 20 miles from the Ampanihy drilling site chosen by Mons. D. Levat. That the Government is repairing the road in order to facilitate transport. That during the enforced idleness of the Marohaolo drill six houses have been erected for the company's employees. An ample supply of fuel has been collected and stored at each drilling site for firing the boilers." Since the above was written Mr. Skertchly has cabled: "Drilling new hole."

A BIG STEEL CORPORATION AND ITS EMPLOYEES.

Examples from the United States of "Safety First" and Welfare Work.

A special report presented at the stockholders' meeting of the United States Steel Corporation on April 20 gives the following particulars on the work which has been undertaken on behalf of the employees:—

ACCIDENT RELIEF AND PREVENTION.

The voluntary accident relief plan, established by the Corporation before Workmen's Compensation laws had become operative anywhere in this country, has been successfully continued in all those states where it has not been superseded by such statutes. The amount paid in 1913 to and for our injured workmen, including expenditures both under our plan and under workmen's compensation laws, was $2,564,839. This 85 per cent. of the total amount expended by reason of work accidents was paid out to the injured men and their families or in taking care of them. Our accident-prevention work has reached a high point of efficiency. Effort is now being directed toward teaching the workmen habits of caution, making watchfulness against dangers to themselves and their fellows a matter of constant attention. It has been necessary to overcome recklessness and disregard of dangers which had come to be treated as customary risks of the trade against which the men would not take any precautions; to teach them that taking risks will not be permitted. The cost of safety work in 1913 was $660,593. Serious accidents per 1,000 employees are now 38½ per cent. less than in 1906, when this work was first taken up by the Corporation. This means that 2,273 men, who might have been injured under earlier conditions, were saved from serious injury during the year.

SANITATION AND WELFARE WORK.

In sanitation many improvements have been made in the proper investigation and observation of water supply and distribution to the men. All sources of drinking water are analysed periodically. Great care is taken against possible pollution. The most modern and sanitary methods are used in the proper cooling and distribution of water, including the sanitary drinking fountain. The common drinking cup has been practically eliminated. The investigation of water supplies and the installation of drinking-water systems alone cost $130,000 during the year. The common or roller towel has been abolished Wash-rooms, shower baths and lockers, started in earlier years, have been extended. During 1913 there were installed 1,193 wash basins, 210 showers, and 15,471 lockers. Two additional swimming pools for general use in the mining towns were built during the year. The cost of providing washing facilities for 1913 was $141,000. The total cost of sanitary work was $564,977 during the year. In welfare work of a character not covered by plans already mentioned for benefiting the workmen, our companies have tried many interesting things. They now maintain in the popular districts around their plants 101 children's playgrounds with an average daily attendance during last summer of 8,688 children. At a number of the plants visiting nurses are available.

PENSION FUND.

The pension fund has proved so satisfactory that no changes of any moment have been required. The number of pensioners continues to increase, with a corresponding increase in expenditure. Total number of pensioners, December, 1913, 2,092; number of pensions granted during 1913, 425; total amount paid in pensions during 1913, $422,815; average age at which pensions were granted, 63.73; average service of pensioners, 28.82; average pension granted, $20.85 per month. The total expenditure of the Corporation in 1913 for improving the condition of its workmen was $7,240,669, apportioned as follows: Relief for men injured and families of men killed, $3,013,638; accident prevention, $660,594; sanitation and welfare work, $1,600,243; pensions, $486,195; toward creation of a permanent fund, $500,000; employees' stock subscription plan, $1,000,000.

MINE MODELS.

I.M.M. Discussion on Mr. Marks' Paper—The Messina Reproduction.

The transactions of the Institution of Mining and Metallurgy to hand by this mail contain contributed remarks by Mr. Wm. Whyte on the paper entitled "A Mining Model," by Mr. E. O. Marks, Student.

Mr. William Whyte remarked: The literature available regarding mine models is both scanty and unsatisfactory, and Mr. Marks' paper will be welcomed as a valuable contribution to the subject by all interested in the representation of mines. Certain classes of deposit (particularly strata such as coal seams, or the Rand banket) are, in general, easily and adequately represented by plans, but mines containing massive deposits, intersecting veins, or divergent ore-shoots with dips approaching the vertical, cannot be properly shown on a single plan, and a series of drawings becomes necessary. These drawings can only be properly understood and mentally correlated by a trained mine surveyor, a fact which considerably circumscribes their utility, and in such case a model is of the greatest service. To be satisfactory, the model should be as close a reproduction of the mine as possible, so that the lay visitor and the non-technical underground men may readily understand it. Those made of glass sheets, or opaque, solid materials both suffer in this respect, the former being but little advance on sectionalised plans. The model described by Mr. Marks is an effort in the right direction, and for the representation of large areas to a small scale would probably be found quite clear and satisfactory. For details of a single mine, however, such a construction would not be so useful. The following particulars of a model showing the deposit at the Messina Copper Mine will be of interest in this respect, as it illustrates a different method. The manner of construction used was evolved by the manager (Mr. J. Allan Woodburn) after investigations and trials covering a considerable period. It is well adapted to local requirements, and is believed to introduce some unique features capable of general application. In constructing this model the primary object was to study the ore deposit, and to allow visitors, both lay and technical, to get a clear idea of the mine workings. It has, however, proved of great value in other ways, and is constantly used in preference to the plans during the discussion of general mine work.

The model is secured to and supported by a backboard of a size which takes in the whole mine to a 1/500 scale. This board is made of ½in. pine planks bound together by a couple of battens 2½in. x ¾in. in section. The battens project 9in. beyond the board on either side and form a convenient means for support and handling, as well as allowing for future lateral extension. The board is painted white, and on it are drawn faint lines indicating the general section of the outcrop and the depth of the various levels. A board of poplar, as thin as can be cut in the shops, is bent to conform with the surface line. It is supported and attached to the back by means of light brackets made from ⅛in. iron rods. This board also is painted white, and on it are shown the shaft and winze collars, roads, railway, and ancient workings in a conventional manner. The principal buildings are indicated by models, approximately to scale, made from stiff drawing paper, the roofs being painted red. Similar models, on which details of the iron work are sketched, form good representations of the headgears. The boiler chimney is of wood, surmounted by a tuft of cotton-wool, tinted with Payne's grey. The outlines of the levels were transferred from the mine plan to poplar boarding of a thickness equal to 7ft. to scale. They were cut out with a fret-saw, and afterwards sand-papered and painted white. Where a level passes through an ore-body of considerable width the cross-section was sketched on the board, which was cut accordingly. This gave a shape on which to model the ore-shoots. The levels are laid on and bound with copper wire to light brackets, similar to those supporting the surface, screwed at suitable places along the lines indicating their positions. Pieces of wood of correct section, glued in place, show winzes and shafts. In the case of the latter it was found better to make them in sections from level to level rather than to use a single continuous piece. The choice of a suitable material for the representation of the ore-shoots was the greatest difficulty, but eventually ordinary leaf-gelatin was adopted. Pieces were cut to shape, dipped into water, and placed into position: work requiring both speed and dexterity, as after wetting the gelatin soon becomes limp and pulpy. Gelatin proved an excellent substance for the purpose. It attaches readily and rapidly to the supports without other adhesive, can be shaped and patched easily, and remains sufficiently transparent for winzes and levels in the ore to be still visible. Its greatest disadvantage is an excessive contraction on drying, which tends to pull the levels out of position. This can be overcome to some extent by suitable allowance when cutting and laying the pieces. A slight pull was found advantageous, as it bound the levels firmly together, and the complete model has considerable rigidity in spite of its fragile appearance. A transverse dyke outcropping near the shafts is also conveniently shown by gelatin. The model was finished by tinting the ore shoots red and the dyke green, thus making them stand out clearly against the white background.

The best "Reef Traveller" is the *South African Mining Journal.*

Rhodesian Section.

LATEST MINING NEWS.

The April Output—Geological Survey Debate—King's Asbestos Mine—The Oleander Mine.

The total value of Southern Rhodesia's mineral output for the month of April has been officially declared at £314,044, as compared with £291,440 in March. This constitutes the "record" month's production. The figures for the last two months read as under:—March: Gold, £273,403; silver, £1,134; lead, £269; chrome iron, £6,915; coal (sales), £9,336; asbestos, nil; diamonds, £383; total, £291,440. April: Gold, £295,907; silver, £1,146; lead, £235; chrome iron, £6,788; coal (sales), £8,610; asbestos £1,170; diamonds, £188; total, £314,044. Except as regards the gold production, there were no very great changes. The asbestos return, from the new fields at Victoria, of course, is, however, very satisfactory; while there was a welcome, if small, recovery of diamonds from the Somabula areas. Chief interest in gold production naturally centres in the operations of the new producers, viz., the Shamva, the Cam and Motor, the Bell, and the Antelope, which between them account for the whole of the recent increase in the output total. At the Shamva everything appears to be proceeding satisfactorily, and the engineers' original estimates are likely to be fully borne out, if not actually surpassed. At this mine 56 Nissen stamps were brought into commission, and these, with eight tube mills, crushed 39,012 tons of ore, which, after full treatment, yielded 6,450 ozs. of gold, valued at £27,093. There was still a certain amount of plate, etc., absorption going on and the rock put through was still not of the full average grade. The whole plant, so it is understood, is by now in full commission and is running with great smoothness. An idea of its capacity can be gained from the fact that, on one day during the present month, no less than 1,800 tons of ore were crushed; while the "residue" is worth no more than 10d. per ton. As to the Cam and Motor, the only information available is that afforded by the published recovery returns which include, it is understood, the results from the 12th March to the end of April. The actual figures read: 17,711 tons of ore treated; recovery in gold, £24,574. This only works out at a recovery value of something like 27s. 6d. per ton, and does not at all correspond with previously published estimates. It is plain, therefore, that the difficulties spoken of in connection with the starting-up of the plant on this property have not yet been overcome. The returns from the Bell Reef in March were 1,911 tons crushed and 738 ozs. won; in April the corresponding figures are 1,933 and 697. No explanation accompanies these figures, which, as there is no known difficulty in connection with the plant or treatment, are disappointing. The Antelope's yield was just over £6,000.

* * * *

In the Legislative Council on the 22nd ult., in the discussion on the Estimates, the vote for the Geological Survey was the subject of some debate. Mr Mitchell thought the Survey should be done away with. When it was asked for they had high hopes of its economical value. That had not been realised. He held that the B.S.A. Company could contribute more. Mr. Collings thought the Survey should go on. It should be more of an Advisory Board for prospectors. Though it might be a lottery, one prize would repay all. Captain Bucknall thought it was not so much desired to abolish the Survey as to get the B.S.A. Company to pay a fairer share of the cost. The Administrator said the remarks and suggestions were noted. Regarding the Company's contribution, considering the share they got from the minerals, he thought their contribution not out of proportion.

* * * *

The mine manager of the King's Asbestos mine reports: "I have a large gang of boys on now and have cut through from the big cutting to the quarry. Although there was no sign of asbestos on the surface, except here and there, each boy filled his 100 lb. bag daily while on the work. The cutting is nearly 600 ft. in length. I am getting close on 3 tons fibre per day now and expect to do better when the new boys get the hang of the work. I have cut a fine road from Victoria from the Chrome Kopje, and there will not be the slightest difficulty with the drift on the Umshandik River when the railway comes along. The drift is nearly 125 ft. wide and the banks are low. My new road is quite the best in this part of the world. It is an ideal motor run all the way to Victoria now."

* * * *

A Gatooma correspondent writes to the *Rhodesian Mining Review*:—The pumping of water at the Oleander mine has reduced it considerably, but the lowest levels have still to be de-watered. The majority of the working mines out Shagari way are active, but many of them are becoming anxious over the water supply during the next few months of dry weather. The roads are usable because of the absence of rains, but next rainy season they will be more deplorable than ever, and, apparently, the Public Works Department is not likely to do much.

* * * *

The directors of the Antelope Gold Mine (Rhodesia), Ltd., in their report presented at the annual general meeting, held on the 20th May, 1914, state, *inter alia*:—

> There has been a reduction in the development done during the past year, but a considerable amount of work has been carried out in connection with the completion of the stope-drives, and in getting the mine ready for crushing. The stopes are continuing to open up satisfactorily, and so far the grade of ore has proved to be fully up to the value given in the assay plan of the mine. The erection of the reduction plant was completed and a commencement made towards the end of the year. All sections are reported satisfactory with the exception of the pans, which failed to deal with the tonnage required. To overcome this difficulty, it has been arranged to instal a tube mill, which it is hoped will enable the engineers to treat the monthly tonnage estimated. It was originally intended to realise part of the company's share investments to provide funds to complete the plant and bring the mine to the crushing stage, but as the depressed state of the share market rendered this impossible, your directors entered into an agreement with the Gold Fields Rhodesian Development Company, Limited, under which that company undertook to advance the amount necessary for that purpose.

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RHODESIA'S APRIL MINERAL OUTPUT.

Another Record Yield—Gold Return, 70,336 Ounces.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of April, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Abercorn 1 (W. J. Lane)	2	210	98·18	412
Do. (sands)	—	144	23·94	100
Agincourt (H. L. Maidwell)	10	249	146·21	614
Alexandra (J. Stewart)	2	60	29·93	126
Antelope G.M. (Rhod.), Ltd.	2BM 10P	2,409	747·70	3,140
Do. (sands)	—	347	709·05	2,978
Atlas (Est. R. Barkley, decd.)	10	840	65·79	276
Do. (sands)	—	500	21·50	90
Bembesi (Ding Dong Syndicate), March and April	2	97	31·72	133
Blanket (Forbes Rhod. Synd., Ltd.	15	1,175	134·96	567
Blue (J. Eisenhammer)	2	150	50·66	213
Bobs (F. W. Spencer)	5 1C	550	38·82	163
Borrow (W. H. Robinson)	2	270	51·85	218
Bucks and Prestwood (J. Black)	5	644	170·25	715
Bushtick Mines, Ltd.	20 Nis.3T	6,158	195·66	822
Do. (sands)	—	3,805	525·65	2,208
Do. (slimes)	—	2,280	281·67	1,183
Burton (S. H. Burns), sands	—	1,038	35·46	149
"C" (D. and C. Syndicate)	10 1C	1,280	82·73	347
Do. (sands)	—	1,029	82·60	347
Do. (slimes)	—	251	37·15	156
Carry (S. and G. Syndicate)	1 H	98	307·40	1,291
Claremont and Nelly Extra (B L. Whyte)	5·2 Nissen	824	118·28	497
Colleen Bawn (Colleen Bawn Synd., Ltd.)	6 2P	717	38·77	163
Do. (sands)	—	425	58·85	247
Do. (slimes)	—	512	81·04	340
Concord (W. Reid)	5	431	31·96	134
Cottage (Cranleigh Syndicate)	2	35	20·40	86
Do. (sands)	—	50	8·83	37
Criterion Gold Mines, Ltd.	10	1,551	338·35	1,421
Do. (sands)	—	1,005	55·71	234
Cumberland (H. W. Bearcroft), clean up	—	—	29·22	123
Drinmaur (T. Berwits)	(2)	30	7·12	30
Eagle A. (Macdonald & Co.)	10	352	85·95	361
Do. (sands)	—	330	32·24	135
Elumba A. (Cooper & Bosomworth)	5	620	152·20	639
Do. (sands)	—	300	81·38	342
Euphorbia (D. W. K. Synd.)	1H	28	16·10	68
Farvic (H. S. Henderson)	5	617	166·68	700
Do. (sands)	—	325	22·03	92
Flora (E. E. Beecroft)	5	250	162·72	679
Fred (Transvaal & Rhod. Est., Ltd.)	10 2P	1,650	792·29	3,328
Do. (sands)	—	1,650	221·67	931
Godwin B. (Barrett & Stacey)	5	143	428·62	1,800
Do. (sands)	—	370	48·72	204
Golden Butterfly (Wheeler, Davis & Rintoul)	5	456	138·33	581
I—Alone (J. F. Gordon)	3	58	27·88	117
Imbusine (M. H. Brookes), by-products)	—	—	4·44	19
Intabanenda (Est B. Smallie, decd.)	5	327	74·20	312
Do. (sands)	—	200	15·30	64
Jumpers (J. P. McCay)	5	500	235·57	989
Do. (sands)	—	300	62·14	261
(J. A. Warwick), March and April	5	497	136·33	573
Do. (sands)	—	174	25·10	105
Laxey (Manx Syndicate)	4	200	47·24	189
Li Hung Chang (E. F. Clayton), sands	—	300	10·85	46
Limes (Wensdorf & Zotta)	5	210	30·44	128
Little Beauty (T. A. Mathews)	3	45	38·83	163
Lone Hand (Armstrong, Furber, & Alexander)	5	479	123·89	520
Lonely Reef G.M. Co., Ltd.	20 3T	5,100	915·16	3,844
Do. (slimes)	—	5,100	3,176·28	13,340
Long John & Lady Lina (Susanna Mines, Ltd., & B. E. Co., Ltd.)	13	990	147·91	621
Do. (sands)	—	887	117·34	493
Do. (slimes)	—	313	32·88	138
Mac's Luck (J. O. Jansson)	5	115	22·99	97
Main Road (Triggs & Huntley)	5	221	64·07	269
Mamba (J. M. Stone)	5	14	11·25	47
Matabele Queen's Co., Ltd.	10	1,785	362·06	1,521
Do. (sands)	—	1,785	307·72	1,292
Do. (slimes)	—	570	68·68	288
Monti (A. D. Hall)	(5)	161	65·49	275
Namaqua (T. W. Angus)	2	120	27·06	114
N'daba (M. Westerberg)	2	16	6·18	26
Nelly (F. D. Roscoe)	3H	848	525·97	2,209
Do. (sands)	—	360	44·75	188
New Eclipse (J. R. Stewart)	5	680	169·74	713
Do. (sands)	—	320	10·48	44
New Insimbi (P. G. Challen)	5	95	22·75	95
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	2,147	602·81	2,532
Do. (sands)	—	1.359	107·46	451
Ontario (Bournes & French)	5	154	37·95	159
Peach A. (Peach Syndicate)	5	110	284·53	1,195
Penzance (Penzance Trib. Synd.)	2	90	23·39	98
Do. (sands)	—	43	24·27	102
Princess (C. A. Abbott)	2	245	67·82	285
Riverside (R. Martindale)	2	70	76·81	323
Do. (sands)	—	56	8·48	36
Roan (J. Robinson), March	2	72	18·33	77
Rous 1 (A. G. Hadingham)	2	71	19·94	84
Sabi Extra (R. T. Bain)	10	269	101·13	425
Smiley D.B. (C. Brunton), sands	—	700	31·19	131
Star (Star of Rhodesia, Ltd.)	5	142	42·90	180
Sun Yat (R. T. Bain)	(10)	75	19·90	84
Susanna (Susanna Mines, Ltd.)	(10)	197	109·00	458
Teutonic (Macdonald & Bonshor)	5	650	508·71	2,136
Tuff Nut (King's Syndicate)	5	210	105·60	444
Do. (sands)	—	180	21·19	89
Umviga (Cumings & Berry)	(3)	152	21·44	90
Do. (sands)	—	360	38·01	160
Umvoti (Henderson & Toshack)	2	200	111·10	467
Vauxhall (M. H. Brookes), by-products	—	—	2·67	11
Winifred (Exchange Syndicate)	5	333	95·38	401
Do. (sands)	—	160	24·35	102
Bulawayo district total			16,440·67	69,049
Gwelo District—				
Alderman (Williams & Woodger)	3	225	124·07	521
Ardpatrick (Frau & Razzals)	3	375	103·98	437
Arizona (L. R. Evans)	2	70	16·92	71
Bedad (A. & B. Syndicate)	5	320	93·38	409
Bell Reef Dev. Co., Ltd.	2B 1T	1,933	697·36	2,929
Blue Gum (H. B. Christian), March and April	1H	320	82·41	346
Do. (sands)	—	324	10·23	43
Bonsor (Cornish Syndicate)	20	2,998	350·25	1,471
Do. (sands)	—	1,750	95·70	402
Cactus (Renton & Gray)	5	488	91·35	884
Do. (sands)	—	438	62·96	264
Camelia (S. Levin)	5	993	373·32	1,568
Collingwood (Pine & Wearing)	5	200	156·39	657
Csardas (Wolfshal Syndicate)	10	614	456·43	1,917
Do. (sands)	—	480	92·64	389
Do. (slimes)	—	134	9·24	39
Elysion (Holmes & Urquhart)	5	190	24·27	102
Fenella (J. Kinrade)	5	30	14·04	59
Gaika G.M. Co., Ltd.	5 1C	3,394	1,446·12	6.074
Do. (sands)	—	1,431	131·77	553
Do. (slimes)	—	2,210	220·76	927
Gartley (Mrs. A. J. Grant), February and March)	2	125	77·49	325
Do. (sands)	—	50	7·33	31
Glen Rosa (H. G. MacKintosh)	2	189	83·76	352
Globe and Phoenix G.M. Co., Ltd.	40 10P	6.203	5.808·97	24.397
Do. (sands)	—	4,016	1.307·05	5,490
Do. (slimes)	—	2,368	375·12	1.576
Do. (concentrates)	—	244	362·24	1,521
Gothic and Pagamesa (Mashonaland Agency, Ltd.)	15 2P	1,350	362·73	1,538
Do. (sands)	—	1,705	235·92	1,000
Do. (slimes)	—	575		
Gretna Green (M. L. Price)	5	180	92·58	389
Do. (sands)	—	510	37·34	157
Invulnerable (W. H. Steele)	5	72	10·27	43
Do. (sands)	—	110	7·66	32
Kaka Main (I. Maleham), March and April)	5	861	142·92	600
Little Blossom (J. Hazlehurst)	2	155	121·84	512
Maise Luck (J. Jones)	6	120	49·99	210
Moonie River (Yellow Jacket Synd.), sands	—	390	19·90	84
Moss (James & Morrisby)	2	405	206·77	868
Do. (sands)	—	412	41·02	172
New Dunraven G.M., Ltd.	5	700	96·84	407
Do. (sands)	—	600	41·16	173
Redhill Dev. Synd., Ltd.	1 C	2,500	88·79	373
Do. (sands)	—	1,208	81·80	344
Shamrock (Crampin & Masters)	10	1,600	158·62	666
Do. (sands)	—	400	16·69	70
Snowed Up 1 S.E. (James & Morrisby)	5	437	97·86	411

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Spiral (C. C. Stack)	2	55	10·00	42
Stranger (J. M. Havnar)	2	124	47·41	199
Tebekwe B. (A N. Tyrrell)	10	1,508	252·02	1,058
Tebekwe 1 (A. N. Tyrrell)	5	403	174·19	732
Tebekwe B. (H. C. Baker)	10	249	91·16	383
Wanderer (Selukwe) G.M., Ltd.	4GR	12,090	1,606·25	6,746
Warner (Yellow Jack Synd.)	5	500	36·42	153
Yankee Doodle (Bruhns & Schwarz)	10	1,473	343·32	1,442
Do. (sands)	—	962	225·84	948
Gwelo district total			17,372·86	73,006
Matabeleland total			33,813·58 ozs.	
Value			£142.055	
MASHONALAND.				
HARTLEY DISTRICT—				
Acorn Gold Mines, Ltd.	5	522	139·89	583
Do. (sands)	—	260	51·32	216
Agnes (P. S. Triggs)	5	400	121·10	509
Do. (sands)	—	252	9·94	42
Alabama (Alabama Syndicate)	2	60	25·56	107
"Assay Plant" clean up (Est. L. Rodwell, decd.)	—	—	·71	3
Baltimore & Virginia (P. A. Enke)	1 Pn	567	96·95	407
Brilliant (Mabel's Luck Synd.)	5 1P	953	398·29	1,673
Do. (sands)	—	281	93·83	394
Do. (slimes)	—	960		
Brompton (R. R. Aitken)	5	590	139·19	580
Do. (sands)	—	450	58·08	244
Cam & Motor G.M. Co., Ltd.	Roasting	17,711	5,795·76	24,574
Cheshire Cat (Arnold & Windley)	5 1P	508	166·12	698
Do. (sands)	—	338	28·33	119
Do. (slimes)	—	152		
Concession (C. E. Simpson)	5 1C 2P	2,735	509·09	2,138
Do. (sands)	—	1,816	120·41	506
Dalny (Macdonald & Sale)	5	900	48·09	202
Do. (sands)	—	490	125·99	529
Do. (slimes)	—	400		
Dalny 1 N.E. (C. Fallon)	5	200	33·25	140
Dalny 1W. and Whistlecock (Macdonald & Sale)	5	500	80·50	338
Do. (sands)	—	255	72·35	304
Eiffel Blue (Willoughby's Cons. Co., Ltd.)	10	1,278	529·53	2,224
Do. (sands)	—	836	45·66	192
Eileen Alannah Mining Co., Ltd.	10	2.152	1,015·18	4,264
Ella Luxat & Morrison)	5	270	34·10	143
Enny Ext. (Ellsmoor & Goodyer)	5	500	86·50	363
Do. (sands)	—	480	47·14	198
Giant Mines of Rhodesia, Ltd.	30 2T	11.456	1,699·29	7,208
Glasgow Mines, Ltd.	5	625	126·18	530
Do. (sands)	—	270	46·98	197
Glencairn No. 3 (Glenrosa Mines, Ltd.)	5	650	169·84	713
Do. (sands)	—	436	68·07	286
Golden Valley (J. Mack & Co.)	10	496	161·37	678
Do. (sands)	—	240	58·99	248
Hepworth 1 (L. Heilman)	2	196	52·34	220
Inez (Harrill & Smith)	10	1 030	84·70	356
Do. (sands)	—	635	62·17	261
Inez (Harrill & Smith)	10	1,030	84·70	356
Juno (H. R. Nicholl)	5	190	28·45	120
Do. (sands)	—	324	32·74	137
Do. (slimes)		150		
Kanyemba (Kanyemba Synd.)	5	520	432·22	1,815
Do. (sands)		320	161·53	678
Kenley (T. McGarry), clean up	—	—	2·71	11
Midwinter (Midwinter Syndicate)	4	397	65·65	276
Do. (sands)	—	240	18·89	79
Moliere What Cheer (H. Moser)	5 1H	565	195·63	822
Monastery B. (Sacks & Jafschitz)	5	6	10·57	44
Mudale (B. C. Munro)	2	160	243·51	1,023
Orcus 17 (St. Kilda Syndicate)	2	22	20·11	85
Owl (A. Rolfe)	10	1,376	912·56	3,833
Do. (sands)	—	1,325	268·31	1,127
Pickstone Gold Mines, Ltd.	10 1C	2,630	289·82	1,217
Do. (sands)	—	1,362	276·24	1,160
Do. (slimes)	—	869		
Pomposo (J. Knott)	5	410	196·25	824
Seigneury (Arnold & Windley)	5	447	184·41	775
Do. (sands)		300	20·42	86
Shepherds (Phœnician (Rhod.) Co., Ltd.)	5 1T	886	261·99	1,100
Do. (sands)	—	886	151·25	635
Sid (Sebakwe & Dist. Mines, Ltd.)	5	558	163·89	688
Do. (sands)	—	810	58·11	244
Thistle Etna G.M., Ltd.	1C	3,157	777·14	3,188
Do. (sands)	—	2,783	174·33	732
Do. (slimes)	—	737	50·46	212
Trinidad 1 (T. McDowell), sands	—	300	17·90	75
Trinity (G. C. Hooper)	3	178	57·00	239
Various Reefs (F. J. Nalty, decd.), sands	—	800	33·34	140
Victoria 2 (Crown Syndicate)	2	150	28·13	118
Do. (sands)	—	120	25·44	107
Washington (I. J. Minnaar)	5	460	616·22	2,588
Do. (sands)	—	400	41·15	173
Hartley district total			18,240·54	76.836
LOMAGUNDI DISTRICT.—				
Eldorado Banket G.M. Co., Ltd.	20 2C 8P	4,768	1,750·38	7,423
Do. (sands)	—	4.527	438·94	1,861
Linnet (A. R. Morkel)	2 Nissen	924	115·46	485
May (May Syndicate, Ltd.)	5	522	66·45	279
Medway (F. L. Standon)	5	347	40·71	171
Lomagundi district total			2,411·94	10.219
MAZOE DISTRICT.—				
Botha H. (Cunningham & Allison)	5	1,200	65·24	274
Do. (sands)	—	600	70·69	297
Glandore (Harries & Cooke)	2	198	111·68	469
Jumbo G.M. Co., Ltd.	30	3,000	525·59	2,225
Do. (sands)	—	1,840	348·65	1,482
Do. (slimes)	—	1,160	61·00	259
Kimberley (Mash.) G.M. Co., Ltd.	6 Nis.2T	3,550	798·68	3,379
Do. (sands)	—	1.700	317·03	1,335
Do. (slimes)	—	1.850	182·89	769
Marie (S. Adrados), pannings	—	—	1·68	7
Micky (Micky Syndicate)	2	484	145·74	612
Mitre 8 (Bishop's Syndicate)	1D	21	19·86	83
Do. (sands)	—	24	4·55	19
Oceola G.M. Co., Ltd.	5	425	150·80	633
Do. (sands)	—	224	12·51	53
Puff Adder Syndicate	2	188	30·11	126
Do. (sands)	—	620	48·21	203
Ravine F. (H. O. Coker)	2	243	52·64	221
Umkulu D.B. 1 W. Head and Manson)	2	—	96·45	405
Do. (sands)	—	—	7·32	31
Venus (Giles & Southey)	2	246	66·98	281
Do. (sands)	—	200	36·44	153
Xmas 1 N.W. (D. Pearce)	2	215	48·76	205
Mazoe district total			3,203·50	13,521
SALISBURY DISTRICT.—				
Alpes (P. Zaffere)	5	210	196·04	823
Arab (Arab Syndicate)	1 D	4	4·40	18
Arcturus (L. Chiappini), sands	—	600	71·06	298
Ceylon (Monarch (Tati) G. M. Synd., Ltd.)	5	536	73·40	308
Cross Your Luck (S. T. L. Synd.)	2	223	80·52	338
Inyague (Hodge & Von Hagan)	2	160	33·53	141
Louise Grand (H. S. Plant)	1H	1,085	114·46	485
Do. (sands)	—	1,085	114·53	481
Mont d'Or (Claxton & Bussell)	2	198	57·68	242
New Brixton (J. H. Hall)	2	100	82·94	348
New Full Back (New Full Back G.M. Syndicate)	2	240	49·90	210
Old Loyalty (Shamva Ilex .GM. Co., Ltd.)	5	483	159·62	670
Do. (sands)	—	491	93·44	392
Olympus C. (D. Peridis)	1H	262	71·49	300
Shamva Mines, Ltd.	56 Nis. 8T	39,012	2,251·38	9,456
Do. (sands)	—	13,172	1,416·04	5,947
Do. (slimes)	—	25,896	2,783·38	11,690
Salisbury district total			7,654·81	32,150
UMTALI DISTRICT.—				
Arthur (M. L. Hoole)	3	28	51·67	66
Cairndhu (E. K. Evans)	—	260	23·72	100
Champion (J. Buchanan)	5	799	94·46	397
Do. (sands)	—	519	128·24	539
Do. (slimes)	—	280		
Comet (S. W. Roberts), March	1H	8	3·22	14
Fairview 3W (P. M. Branken)	5	45	3·69	16
Kent (E. Evans)	5	635	288·58	1,212
Do. (sands)	—	500	81·56	343
King's Daughter D.B. (Umtali Waterfall Synd.), slimes	—	928	69·07	290
Liverpool 89 (R. G. Snodgrass)	5	510	92·77	390
Do. (sands)	—	200	37·79	159
Montezuma No. 2 (Montezuma G.M. Co.)	7	756	178·62	750
Do. (sands)	—	641	36·75	155
Pilgrim 2 E (O. R. Cawood)	5	572	101·25	425
Quagga (Quagga Syndicate)	5	320	52·15	219
Do. (sands)	—	1.000	49·40	208
Queen (G. T. Hopkins)	5	94	13·31	56
Rezende Mines, Ltd.	100	17,600	1,509·36	6,398
Do. (sands)	—	2,759	293·62	1,246
Do. (slimes)	—	1,079	103·91	441
Do. (concentrates)	—	148	589·99	2,473
Do. (slags and pots)	—	2	15·81	66
Surrey (Keir & Rooke)	5	589	243·27	1,022
Do. (sands)	—	800	30·21	127
Umtali A. (H. G. Pearce)	10	479	95·77	402
Do. (sands)	—	372	52·26	219
Do. (slimes)	—	64		
Umtali district total			4,204·46	17,733

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
VICTORIA DISTRICT—				
Empress A. (S.A. Prospecting and Concession Syndicate, Ltd.) ...	5	908	305·79	1,284
Do. (sands) ...	—	567	128·84	541
Do. (slimes) ...	—	300		
Grand Slam (R. Schielke) ...	5	181	24·06	101
Texas (G. Scott) ...	10	1,280	214·69	902
Do. (sands) ...	—	775	134·43	565
Victoria district total			807·81	3,393

Mashonaland total ... 36,523·06 ozs.
Value ... £153,852

Total gold production ... 70,336·59 ozs.
Value ... £295,907

SUMMARY.

Gold—	Ozs.	Value.
Matabeleland ...	33,813·58	£142,055
Mashonaland	36,523·08	153,852
Total	70,336·66	£295,907

OTHER MINERALS.

	Ozs.	Value.
Silver, ozs.	11,404·22	£1,146
Lead, tons ...	14·47	235
Chrome iron, tons ...	3,040·80	6,788
Diamonds, carats	61·50	188
Coal, tons (sales)	25,241·00	8,610
Asbestos, tons ...	65·00	1,171
Total value April output,		£314,045

RHODESIAN GEOLOGICAL SURVEY.

The Report of the Director for the Year 1913—Investigation of the Gatooma Area.

III.—SHAGARI DISTRICT.

An area surrounding Shagari township and embracing most of the active mines between the Arlanza and Haji claims, over a distance of about 5½ miles, was mapped in detail. This gold belt trends from south-west to north-east, parallel to the strike of the rocks. Towards the north-east it is continued in the Suri-Suri gold belt, which extends across the Suri-Suri River. The Shagari gold belt lies close to the edge of a gently-rolling, bush-covered plain, which, almost uninterrupted by kopjes, stretches eastward to Hartley and southward to the ridge of hills behind Gatooma. Towards the north-west the ground breaks away, falling gently to another plain about the lower courses of the Shagari and Suri-Suri Rivers. This gold belt is quite removed from any large granite mass. The nearest is a prolongation of the large mass lying to the north of Gadzema, which stretches southward across the Umfuli River, and its edge is about seven miles from the north-western end of the area mapped. As in the Golden Valley district and on the Eiffel Flats, the dominant country rock is greenstone, invaded, as in the other fields, by bodies of felsite, which make elongated outcrops trending in a north-easterly direction. The felsites are considerably metamorphosed, and at the surface are usually weathered to buff-coloured schists containing a good deal of fine mica (sericite). The outcrops are sometimes half a mile wide, and are easily recognised by the whitish soil of sandy loam, but where narrow belts of only a few feet occur amongst the greenstones, the alteration of colour in the bright red clay which covers the greenstones is seldom noticeable. Low, narrow ridges covered with blocks of surface ironstone also run in long lines parallel to the strike of the other rocks. They are commonly assumed to indicate outcrops of banded ironstone, but in the trenches and shafts sunk on these outcrops the typical banded ironstone consisting of quartz and magnetite, was never found. Beneath the ironstone capping is soft, iron-stained schist, which in one case at least passes down below water-level into the flinty-looking variety of felsite and is impregnated with pyrites. Whilst this explanation may not apply to all occurrences, it is, at any rate, fairly certain that no typical banded ironstone is present. The general dip of the metamorphic rocks is 60 deg. or 70 deg. to the north-west. A few dolerite dykes traverse the greenstones and felsites. They are later in age than the gold reefs, and occasionally cut across them. Gold reefs are numerous, and as rich discoveries are being made from time to time, the district is by no means exhausted. Whilst most of the reefs are quartz veins, replacement deposits in the greenstones and other metamorphic rocks are not wanting. The quartz reefs are fissure veins running with the strike of the country, and usually dipping to the north-west with the country rock, but exceptions to both rules may be found, especially around Mabel's Luck. The reefs do not as a rule strike exactly parallel to the belts of country rock (such as the coarse and fine varieties of greenstone) or to the main joints, but they run parallel to a cleavage which makes an angle of 10 deg. to 15 deg. to the former structures. These reefs appear to be continually breaking away into the hanging or footwall, as the case may be. Should one of these slightly oblique fissures come up against a particularly massive belt of country rock, it narrows and dies away, but picks up again on the opposite side of the hard belt of country. The phenomenon may be very similar in effect to that of an intrusive dyke cutting obliquely across the reef. A few reefs have a casing consisting of schistose country rock, with the schistosity parallel to the reef. When the casing is cut through a cross-cut, the schistosity is found to be slightly oblique to the joints in the country rock. Most of the lodes thus far developed are small, being three feet or less in width. They are frequently very rich in gold near the surface and down to water-level. The drop in values which takes place below water-level, added to the increased cost of mining and treatment, has frequently discouraged development. Sulphides are not abundant in the unoxidised ores. Pyrites is the commonest and sometimes the only one. In other cases a little mispickel or copper pyrites may be present. Accurate information as to the general length along the strike of the oreshoots is not available, but the shoots appear to be short rather than long. In some instances two or more occur in the same reef, and may be only separated by a few feet of unpayable rock. The chief replacement ores in the schists are on the Arlanza, Jane Anna, Dalny and Dalny West. The first appears to lie on a belt of well-cleaved greenstone schist. It has not yet been opened up in the unoxidised zone. In the Dalny and Dalny West the greenstones have been altered to a mottled yellowish-green rock, which closely resembles that of the Motor lode, and, like it, weathers to a soft schist of variegated yellow, brown and red colours. The ore body is traversed by veins, consisting largely of carbonates, which are crossed by stringers of quartz. The carbonate veins are bluish grey in colour, and weather above the water-level to a brown ochre. Reefs of this kind are naturally easily overlooked. The district is remarkable for its long line of gold reefs, stretching for a distance of over four miles from the Compania claims beyond the Arlanza, through the Turk, Brancepath, Turkois, Turkois Extension, Jane Anna, Dalny West and Dalny. The line is not one of continuous reef, but one or more ore-shoots have been discovered in almost every claim along it, the gold being sometimes in the quartz, sometimes in the schists. It is probably the longest and most continuous line in the Territory yet discovered. The Shagari gold belt is one built up of greenstones and felsites. To judge by the location of the successful mines, the greenstones (red clay areas) would appear to be the more favourable country rock, with the qualification that it is not the areas of pure greenstone, but areas of greenstone containing small bodies of felsite. The bigger bodies of felsite also contain many gold-quartz reefs, but a large number appear of be of small size, though rich in gold down to the water-level. They have not been opened up to any appreciable depth below this. Although large ore bodies requiring a considerable amount of capital for development and treatment will no doubt be discovered from time to time, the number of rich reefs of the smaller size makes the district a favourite with the individual worker and small syndicate. The cost of a plant for treatment, and of its transport and erection, and frequently the lack of sufficient water at hand, are factors which retard the working of these reefs. The Shagari district is one of those which should receive consideration in the event of a decision to erect customs mills, as recently suggested by the President of the British South Africa Company.

KARROO SYSTEM.

Rocks belonging to this system were not encountered in any of the districts actually mapped, but some observations were made during visits paid to other districts. These bear on the relations of the basalts to the Forest sandstones, the former distribution of these rocks over the country, and their relations to the metamorphic rocks. Though not of immediate importance, they have a direct bearing on the geological structure of Northern Matabeleland, and on any attempts to discover valuable minerals in or under its covering of Karroo rocks. A point of local interest was the discovery, through a boring for water, of an outlier of much-weathered Karroo sandstone on Government House Hill, Bulawayo.

PUBLICATIONS.

The following publications were issued during 1913:—Report of the Director, Geological Survey, for the year 1912; Bulletin No. 1, Preliminary Report on the Geology of District East of Gatooma, by A. E. V. Zealley; Bulletin No. 2, The Association of Gold Deposits with Acid Igneous Rocks in Southern Rhodesia, by H. B. Maufe. The two Bulletins commence the series in which it is intended to publish the technical reports of the Department. A third Bulletin is in print, and only awaits the arrival of the colour-printed map from the printers to allow of publication. Two reports are in progress and two more are being commenced.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Safety First.

To the Editor, *South African Mining Journal.*

Sir,—The individual miner may not have many valuable ideas, but the sum total from the workers of the Rand will reach a respectable figure, therefore the action of the Safety First Committee in asking the worker for safety proposals—and more or less taking him into confidence—is a step in the right direction. Many valuable suggestions in the past have had a premature burial owing to not having the life-saving influence of the "learned societies" to keep them above ground. Years after they have been revived and passed on as new births. Any proposal—economic, humanitarian, etc.—from the worker had to oppose the passive resistance of these "societies." For a case in point, Mr. Editor, I wish to refer you to the pages of your valuable journal of nine years ago (I have not the exact date of issue at hand). You will see therein a letter criticising points raised at the Mine Manager's Association meeting. In the said letter I asked, *inter alia:* "Why not give us a few smaller cartridges in each packet or case of explosives to insert into holes of insufficient size?" Now this idea was shelved until the Safety First Committee "saw something in it." As the conditions of drilling and charging holes have not altered in the last nine years, I do not understand how the idea is found more valuable to-day than it was when I proposed it. The workers' valuable ideas are so few that—like myself—he is selfish enough to want any little credit due. We all glibly quote the old saying, "Honour to whom honour is due," but in daily life it is the other man who gets it. My object in writing this letter is to point out to the Committee the importance of gaining the confidence of the worker in this great movement. This can be accomplished only by assuring him that all practical ideas brought before them will have their most earnest consideration, and that the adage quoted will in future have the meaning originally intended.—Yours, etc.,

W. LACEY.

West Rand.

Discovery versus Re-location.

To the Editor, *South African Mining Journal.*

Sir,—While it is indeed gratifying to note how the mineral deposits of the Victoria district (Rhodesia) are at last attracting attention, I fail to see how they can be termed "new discoveries." In 1903 I discovered and pegged the first asbestos, trenched and sank a couple of shafts thereon, and further proved the existence of a "chrysolite asbestos" field measuring approximately 40 miles long by 1 mile wide. Although I sent samples to different parts of the world, I could get nobody to "take it up." To-day, however, it is fairly "setting the village on fire." I have spent many years in Rhodesia prospecting and working small propositions, and honestly believe that the Victoria district deserves all the nice things now being said for it. Among my own discoveries there I can include coal, copper, chrome iron, bismuth, mica, graphite, and a gold-bearing conglomerate much resembling the Witwatersrand banket. Gold-bearing quartz reefs are common over a large area extending east and west of Victoria township, while huge deposits of rubble, though of "low grade," say 4 dwts. gold to the ton, would in these days of economies undoubtedly yield a handsome profit on treatment. Now that this particular district is going to receive "sound financial support," the above-mentioned minerals are pretty sure to be "re-located." While I have quite given up all hope of ever being rewarded for my efforts on those fields, I do not like being robbed of the honour of being the "original discoverer" and by men who will have no more to do than walk on to it and put in their pegs. Apart from the many "nondescript prospectors" one so frequently meets with, there are still some good and intelligent men who, despite all the nasty things that have recently been said of the "prospector and his methods," are still worthy and proud of their calling.—Yours, etc.,

VIDE ET CREDE.

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ROCK TEMPERATURES IN THE MINES OF THE RAND. II.[*]

[By E. J. MOYNIHAN.]

THE authors, in taking the temperatures as the bottom of drill-holes of moderate depth as the basis of the temperature gradient of the rock, followed precedent. How erroneous their general induction is can be seen from one of the statements in their own paper, in which it is pointed out that the average temperatures in these holes were 3.2 deg. F. less after the fan was installed than before it was in operation. They say nothing as to the time of year in which these observations were taken. One naturally presumes that the temperatures of the drill-holes (5ft. deep) were taken about the same time as the other temperatures tabulated in their paper. If this is so, the seasonal difference is quite enough to account for the reduction claimed for the fan, because (according to the 1910 Report of the Transvaal Meteorological Department) the earth temperature varies, at Johannesburg, between January and May, about 5.5 deg. F. at a depth of 4 feet. At a depth of 3 feet 8½ inches at Pretoria the corresponding seasonal difference in 1910 was nearly 10 deg. F. Yet the authors plotted a temperature gradient of the rocks of the Witwatersrand from their diminished drill-hole temperatures. In common with their predecessors, they not only overlooked the facts set out above, but also failed to remember a much more important fact. I have just shown how a mere seasonal difference of surface temperature may effect the temperature at the bottom of a 4ft. hole 10deg. in a few months. The effect of the circulation of air from the surface on the rock walls of a mine is immensely greater. Even before the mine passes out of the development stage into its productive career, the main shafts and a large part of the drives have usually been open for at least two or three years. If a variation of 13 deg. in the surface temperature at Arcadia can and does produce a 10 deg. variation of drill-hole temperature in five months, it is clear that the constant circulation, for years, of air very much below the original temperature of the rock exposed will produce large temperature changes in the rock even at a great distance below its surface. This distance may well be 100 feet or more. This phenomenon, in itself, is enough to account for the discrepancies in rock temperature gradients in mines, as read from drill-holes. The effect of the circulating air is very much added to if the mine be naturally wet, or sprayed for any purpose. If the quantity of water extracted as vapour daily from the mine be 200 tons—(202 tons having been taken out of the Village Deep in 24 hours)—the heat so abstracted from the mine is 430,000,000 heat units. If the air and contained moisture leaving a mine has more total sensible heat than can be accounted for by the sum of its heat on entry plus the balance of the oxidising, mechanical heating, and mechanical refrigerating effects know to exist, then the whole of the latent heat of the moisture carried out of the mine by the air must, on balance, come from the original heat of the rock. In such a case the final temperature of the air is not lowered by the evaporation of the water. It is known that the combined presence of working rock-drills and their crews lowers the temperature in working places in the mines of the Rand by several degrees. This is practically a local effect, and one which as far as the whole mine is concerned is usually negligible. The heating effect due to each man at work is about 60 watts, or, say, 3,000 heat units per day, or less than that due to the combustion of one-fourth of a lb. of coal per man per day. Candles may be taken at the equivalent of ½ lb. of coal per man, or 6,000 heat units per man per day. The heating effect of explosives may also be taken as equal, roughly, to about ½ lb. of coal, or 6,000 heat units per man per day. Assuming 3,000 men underground in a mine like the Village Deep, the total heating effect from these causes is certainly less than 15,000 heat units per man per day. For a force of 3,000 underground men the total is 45,000,000 heat units (corresponding to about 7 deg. rise in temperature for 260,000 subic feet of air per minute for 23½ hours daily), so that roughly 400,000,000 heat units is daily abstracted from the rock. This latter is about the amount of heat obtained by the combustion of 15 tons of coal, or about 11 lb. for each of the 3,000 persons underground. The oxidation of timber and pyrite is clearly negligible as compared with any of the figures already given. I will put the facts another way, which will show the effect more clearly still. Assume that 5,000,000 tons of rock have been taken from the workings, as one sheet 6 feet thick. Then every ton mined has left about 4 square feet of surface exposed. If the above quantity of heat is withdrawn evenly, then about 20 heat units are taken from each square foot of surface per 24 hours by the evaporated water alone. Taking the specific heat of the rock at even 0.2, and the weight of a cubic foot at 170 lb., the cooling effect per sq. ft. of exposed surface would be sufficient to lower the temperature of a cub. ft. of rock about 4 deg. in a week, or of 100 cub. ft. about 2 deg. in a year. In Professor Cadman's paper, an abstract of which appears in the March "Journal" of this Society, attention is drawn to the possibility of a mine being warmed up above the original rock temperature by oxidation. He says that the effect produced will depend upon the rate of oxidation as compared with the rate of ventilation. It seems pretty clear that if a general and constant oxidation is taking place at all in any part of a given ventilating current, then the rate of oxidation is likely to increase faster than the rate of ventilation, as is indeed the case with an ordinary fire. As no one has ever yet mentioned a working mine, not visibly burning, in which ventilation increased the temperature of the workings generally, it is extremely doubtful whether such a mine has ever existed. Professor Cadman also says that both effects are seen in most coal workings: the intake and part of the workings being cooled by the air current, whilst part of the workings and the return are warmed up. This has no necessary connection with an oxidation effect. A similar thing occurs in cases where there is no oxidising effect at all. The circulation of a current of water or air through a hole in an unequally heated solid, parts of which are below the final air or water temperature, must necessarily transfer heat from some of the hotter to some of the cooler parts of the solid. This happens in most deep mines, whether they are coal mines or not. The operation of the ventilating current tends, on the whole, to flatten the original temperature gradient of the rock, and to reduce it to the natural mean temperature gradient which the air has due to compression. This is about 1 deg. in 180 ft. The wet-bulb air temperature gradient will not tend to fall below this figure because the latent heat of the water-vapour will practically all come from the rock, most of the rock being hotter than the air. Unless refrigerating methods are used, we cannot therefore hope to reduce the air temperature gradient below this figure of 1 in 180, as a mean for the year and for the mine. In winter the gradient would be steeper, with slightly lower temperatures at the bottom of a very deep mine; and in summer slightly flatter with a slightly higher temperature down below. The humidity in deep mines, with all stopes and working places sprayed, would be nearly 100 per cent. in both cases. 85 deg. F. wet-bulb mean annual temperature will therefore be met with on the Rand mines at a mean depth of about 5,000 ft. or less, no matter how strong the ventilating current is made. This temperature is judged by Professor Cadman and others to be the limit for fair physical effort, even with good ventilation. If mining is to be carried on economically at greater depths it will be necessary to refrigerate air supplied to the working places. In England the corresponding depth would be about 6,500 ft. It may be said that this is "speculative." Well, compare it with the facts. It is certainly one fact that there is no mining field in the world for which half as low a temperature gradient is claimed as for the Rand. Another is that even in the list of temperatures of 53 mines on the Rand, published in the Government Mining Engineers' report for 1912, there are but four mines returning their deepest temperatures at such figures as to give a flatter air gradient (reckoned from the mean temperature of 60 deg. at the surface) than 1 in 180. One of them is the Village Deep, which returns a temperature of 70 deg. at 4,245 ft.: thus giving the obviously absurd gradient of 1 in 424. Another is the Simmer Deep, returning the low figure of 65 deg. for a depth of 2,300 ft., or 1 in 460. Another is the Van Ryn Estates, giving 60 deg. at 1.600 ft., or no gradient at all (reckoned from 60 deg. at the surface). The fourth is the York, with 58 deg. at the bottom of the mine, and a negative gradient! The temperatures of these four mines, if correctly given, must have been taken in specially cool spots, or on a very cold day. In the list there are 12 mines with air gradients between 1 in 180 and 1 in 150: 24 mines with gradients between 1 in 149 and 1 in 100: and 13 mines with gradients steeper than 1 in 100, the steepest given being that of the New Modderfontein, which is 1 in 61. With the exception of the four doubtful cases just mentioned, therefore, there are no mines in the world, as yet, claiming a flatter gradient than that I have set forth as the flattest probable. The majority even of the mines of the Rand have much steeper gradients, and outside the Rand the gradient is, on the average, about twice as steep.

Dr. F. K. Moll, a German specialist in timber preservation, reports that practically all ties and poles used in Germany are now treated, and that the process is rapidly coming into use for mine timbers. About 22,000,000 cubic feet of the latter, or approximately 10 per cent., were treated last year. Both the open tank and steel cylinder pressure systems are used. Creosote, as a preservative, has been displaced for mine timbers by fluoric salts, and the use of sulphate of copper has been abandoned entirely. Of the timber treated for mine sets, about 80 per cent. is pine, 10 per cent. spruce, 8 per cent. birch, and 2 per cent. oak. Mine timbers as a commercial product are handled largely by the Grubenholz Syndikat. The cost of a small open tank treating plant is about 2,000 marks, while a pressure plant ranges from 8,000 to 10,000 marks.

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[*] A paper read at the last monthly meeting of the Chemical Metallurgical and Mining Society of South Africa.

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Engineering Notes and News.

THE FENCING OF MACHINERY.—II.*

BELT-PERCHES.

These safety appliances are closely associated with the fencing of belts. Where machines are worked intermittently it is a common practice in many factories, aftter the use of a machine, to throw the driving belt off the shaft pulley until the machine is again required, in order to economise power and to save wear and tear of the belt and pulleys. A belt may also slip off the driving pulley accidentally, or may be thrown off intentionally for the purpose of repairs. It is a dangerous practice, however, to allow a belt under such circumstances to rest on a revolving shaft, owing to the liability of the shaft to seize the belt and wind it up. Provision must be made in all cases to keep loose belts out of contact with revolving shafts. There is no danger if the shaft is fenced by a sleeve of metal or other material. In other cases some type of belt-hook or belt-perch must be used, and various forms are available. Whenever any belt repairs are necessary while the shafting is in motion the belt should never be allowed to come in contact with the shaft, but should rest either on the sleeve fencing the shaft or on a belt-perch. Portable perches, consisting of an inverted trough fixed to the end of a belt-pole, are sometimes used, but fixed perches are more satisfactory whenever these are practicable.

BELT-SHIPPERS.

A number of appliances, both portable and fixed, have been devised for replacing belts on pulleys from the floor level in cases where the effect of slowing down the transmission machinery would lead to damage and loss of material, especially where continuous processes are carried on. For belts not exceeding 3 in. wide an ordinary belt-pole may be used. This is a strong, light pole of about 1½ in. in diameter, carrying at its upper end a wrought-iron pin at right angles to the axle of the pole. In most cases belt-poles are easier to handle when pelt-perches of types consisting of parallel bars or a curved metal plate are fixed adjacent to the pulley rims. With such a perch it is said that a belt 9 in. wide can be replaced on its driving pulley by means of an ordinary belt-pole. When the belts are too heavy or the shafting too high to allow the use of a belt-pole, mechanical belt-shippers enable the belt to be replaced on the driving pulleys from the floor level with perfect safety, without stopping or slowing the transmission machinery.

PROPOSED REGULATIONS.

The actual regulations, based on Mr. Smith's investigations, which it is proposed to put forward, are as follows:—Proposed regulations for transmission machinery used in any factory or workshop, or any place, other than a ship, to which the provisions of Section 79 of the Factory and Workshop Act, 1901, apply.

DEFINITIONS.

For the purpose of these regulations:—Transmission machinery includes (i) every shaft, wheel, drum or pulley, coupling, clutch, driving strap, or other device incidental to the transmission of motion between any prime mover and any machine or appliance; and (ii) any wheel, clutch, system of fast and loose pulleys, or other device by which the machine or appliance receives its motion. Prime mover includes every engine, motor or other appliance for the purpose of providing mechanical energy derived from steam, water, wind, electricity, combustion or other source. Driving strap includes every strap, band, belt, chain, rope or other similar appliance by means of which rotary motion is transmitted from one part to any other part of the transmission machinery. Within reach means within a distance of 6 ft. 6 in. in any direction from any spot on which any person employed or working may have to stand or pass at any time, either in the course of his employment or incidentally thereto. Authorised persons means a competent adult male person who is authorised by the occupier for the purpose of Regulations 7 and 17, and whose name is entered in a list of authorised persons kept attached to the General Register.

EXEMPTIONS.

Nothing in these Regulations shall apply to hydraulic or pneumatic pressure mains, or to electrical conductors, or to machines actuated by muscular energy. Regulations 1 and 2 shall not apply: (i) during any work in connection with the examination, manipulation or maintenance of the transmission machinery, provided that (a) the transmission machinery is slowed down so that the speed of any shaft, wheel, drum or pulley within reach is less than six revolutions per minute, and (b) adequate provision is made by means of signals or otherwise for prompt stoppage of such parts at the first sign of danger; or (ii) where it is necessary to approach within reach of transmission machinery in order to cool a hot neck or bearing, such operations are done only by authorised persons and adequate precautions are taken for their safety.

DUTIES.

It shall be the duty of the occupier to observe Part I. of these Regulations. It shall be the duty of every person employed or working to observe Part II. of these regulations

PART I.—DUTIES OF OCCUPIERS.

1. The following parts of the transmission machinery, if in motion, shall be securely fenced:—(a) All shafts, couplings and collars within reach. (b) All other shaft couplings except those constructed with countersunk bolts and nuts, shrouded flanges or other equally safe devices. (c) All set-screws on shaft collars, except such as are countersunk or otherwise made equally safe. (d) All projecting keys within reach, except feather keys and sliding keys. (e) All parts of wheels, drums or pulleys within reach, except such as are, by construction or position, equally safe to every person employed or working as they would be if securely fenced. (f) All driving straps with projecting metal fasteners or loose ends if within reach. (g) The underside of every overhead driving strap, at those parts where any person employed is liable to have to stand or pass under them at any time either in the course of his employment or incidentally thereto; except (i) ropes less than 1 in. in diameter, and (ii) driving straps (other than ropes or chains) less than 4 in. wide and moving with a velocity of less than 30 ft. per second. (h) All metal driving chains within reach and the underside of all overhead metal driving chains. (i) All driving straps which pass through floor openings. (j) All other driving straps, within reach, except those which (i) are less than 3 in. wide, and (ii) move with a velocity of less than 20 ft. per second. 2. All fencing required by these regulations shall be constantly maintained in an efficient state and kept in position which the transmission machinery is in motion. 3. Efficient devices or appliances shall be provided and maintained in every room or place in which work is carried on, to throw out of gear and stop promptly each unit of the transmission machinery in that room or place. 4. Efficient appliances shall be provided and used to prevent any driving strap, thrown off a wheel, drum or pulley, coming in contact with any shaft in motion. 5. Efficient appliances shall be provided

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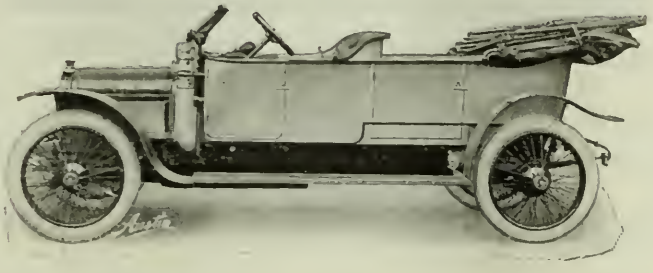

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and used for putting driving straps on or throwing them off wheels, drums or pulleys on main shafts in motion, except where such shafts are stopped or the speed is less than six revolutions per minute. 6. Suitable striking gear or other efficient mechanical appliances shall be provided and used to move driving straps on fast and loose pulleys which are transmission machinery. Such gear or appliances shall be so constructed as to prevent accidental restarting of the machinery. 7. Lubrication of bearings, gear wheels, loose pulleys, metal chains and other parts of the transmission machinery shall be done only by authorised persons. 8. Adequate provision shall be made by means of signals or otherwise for prompt stoppage of the transmission machinery at the first sign of danger, whenever any work of manipulating driving straps or other work of maintenance of the transmission machinery is being done. 9. Service platforms and gangways for overhead shafting shall be securely fenced with guard rails to a height of 3 ft., and toeboards shall be provided. 10. Efficient lubricators shall be provided for the bearings of all shafts which are transmission machinery, except self-lubricating bearings. 11. Driving straps shall not be treated with resin or any composition, unless at rest or unless the speed of the pulleys concerned is less than six revolutions per minute. 12. Cleaning and polishing of shafts, couplings and other parts of the transmission machinery in motion shall not be done with cotton waste, rags, emery cloth or other similar materials held in the hand. Unless automatic travelling cleaners are used, safe and suitable appliances shall be provided for the purpose of cleaning and polishing, and shall be used from the floor level or from securely fenced platforms or gangways as far as is reasonably practicable. 13. Every shafting ladder or ladder used in connection with transmission machinery shall be fitted with effective non-skid devices. In rooms where persons work with bare feet ladders shall not be fitted at the bottom with iron spikes. 14. A competent person or persons shall be appointed to carry out systematic inspection with regard to the requirements of these regulations. Each such person shall keep a book and record therein any breach of the regulations observed by him or brought to his notice, and also the steps taken to remedy them and prevent their recurrence.

PART II.—DUTIES OF PERSONS EMPLOYED.

15. All fencing and safeguards shall be properly used for the purpose for which they are provided, and if removed for any reason they shall be replaced as soon as practicable. 16. No person shall in any way interfere, without the knowledge and concurrence of the occupier or manager, with the means and appliances provided by the employers for compliance with these regulations. 17 No person other than an authorised persons shall do any work of maintenance of transmission machinery or manipulation of driving straps in motion. 18. Every person employed or working in a room or place within reach of unfenced transmission machinery in motion in that room or place shall wear close-fitting clothing. Aprons or neckties with loose ends shall not be worn by such persons. 19. Every female employed or working in a room or place within reach of transmission machinery in motion in that room or place shall have her hair fastened up, confined in a net, or otherwise secured.

SAFEGUARDING THE USE OF ELECTRICITY IN MINES.*

ELECTRICITY must be safeguarded everywbere that it is used. The conditions that exist underground make the use of safeguards more essential there than almost anywhere else. *Electric Shock.*—Electric shock is the greatest danger in connection with the use of electricity in mines, because conditions existing underground are so favourable to its occurrence. Men are often obliged to work in more or less uncertain light near bare wires that are carrying dangerous potentials. The fact that the men are standing on the earth practically connects them to one terminal of the electric generator. The most dangerous piece of electrical equipment underground is the trolley wire. It is necessarily bare and extends for long distances throughout a mine, often less than a man's height from the track rail. Sometimes the making up of trips of cars must be done near low-hanging trolley wires. All bare wires offer the same danger that trolley wires do, although not to the same extent. Apparatus that has accidentally come in contact with the ungrounded side of an electric circuit is almost as dangerous as the trolley wire. A severe and even fatal shock may be obtained by coming in contact with the frame of a motor or a switch box that has become charged with electricity, or "alive," as it is usually termed. It is also possible to obtain shocks from the frames of locomotives and cars if track sanding, poor bonding or a similar cause has put a high resistance to earth in the path of the current. *Fires Caused by Electricity.*—The danger from fires caused by electricity arises principally from defective installation and careless upkeep or from injuries to equipment resulting from falls of roof or similar causes. Fires may be started by unrelieved short circuits, or grounds, by the blowing of open fuses, and by the overheating of resistances. Incandescent lamps can produce heat enough to ignite combustible materials if the dissipation of the heat from the bulbs of the lamps is allowed to become restricted. The fire danger is more remote than the shock danger, but it may affect a larger number of men. *Explosions Caused by Electricity.*—Explosions may be caused by the ignition of explosives, gas, or coal dust. Accidents due to the ignition of explosives by electricity are of two kinds: Those that occur while handling and transporting explosives near electric circuits, and those that are incident to the detonation of explosives by electrical means. Some very mysterious accidents of the first kind have occurred, but I believe that most of these have been caused by hauling explosives in metallic packages, or else so near the locomotive that flashes or sparks from the trolley wire have come in contact with the explosives. Electrical shot-firing accidents are usually caused by the premature ignition of shots after holes are charged. It is not the best practice to shoot electrically under conditions that require one side of the detonating circuit to be connected to the earth, because wherever grounded systems of power distribution are used unexpected differences of potential exist in the earth in the vicinity of such circuits. If, therefore, one side of the detonator be purposely grounded an accidental ground on the other side may connect the detonator across a potential sufficient to cause ignition. Premature ignitions have been reported which seemingly have been caused by the conditions just described.

Gas Ignition by Electricity.—For all practical purposes it may be assumed that sparks that occur around such apparatus and circuits as are used for power and light in a mine are capable of igniting gas. The ignition of gas by incandescent lamps has been investigated by the Bureau of Mines quite thoroughly with carbon filament lamps, and to a lesser extent with tungsten filament lamps. The results of the investigation seem to indicate that certain of the larger sizes of carbon filaments will ignite gas and that tungsten lamps of 25 watts or more are almost certain to ignite gas when broken. *Ignition of Coal Dust by Electricity.*—The study of the ignition of coal dust by electric arcs and electric flashes has been carried on to some extent by investigators in Europe. The results of their experiments indicate that electric flashes can ignite coal dust suspended in the atmosphere. The Bureau of Mines has planned similar investigations to proceed as soon as funds are available. Everyone connected with mining work knows that the natural conditions surrounding underground installations of any character are such that accidents are likely to occur, and this is especially true of electrical installations. It is not necessary to rehearse all of these conditions, as everyone is familiar with them. *Prevention of Electrical Accidents.*—The knowledge of the existence of danger requires that steps be taken to prevent accidents. It is certain that haphazard methods will not solve the safety problem any more than they will solve the haulage problem or the ventilation problem. Measures to be effective must be well considered. Unfortunately, the safety problem cannot be solved on just the same basis as the ventilation problem, for instance. Safety cannot be calculated mathematically by the use of constants obtained from experience. Definite data as to what will produce safety under the complex conditions involved are not available. It has seemed to me that a good way to begin is to outline methods that, so far as we can see, will surely produce safety, and then to determine how these methods can be put into practical operation. For the sake of discussion, therefore, I will make the following five suggestions for reducing the number of accidents due to the use of electricity in mines:—1. Remove contributory causes. 2. Remove from the vicinity of electrical apparatus all elements susceptible to its influence (gas, dust, explosives, combustible material). 3. Keep the electric current where it belongs. 4. If, under certain circumstances, the current cannot be entirely confined, at least limit the area of its activity by the use of protective devices. 5. Insure a high factor of safety by: (a) Selecting materials and apparatus with care; (b) installing equipment in a strictly first-class manner; (c) inspecting equipment frequently and thoroughly; (d) maintaining it in good condition at all times.

Concerted Action.—Suppose that it is agreed that these measures (or any others) will solve the problem, the next question is how to put these into effect. To get the best results the co-operation of all concerned must be secured. There may be, no doubt there will be, many ways of getting the desired result. Each one has his own experience and his own views based thereon, but disorganised forces acting along different lines will not produce the results of concerted action along lines that, in the light of combined experience, may be agreed upon by the majority of those interested. The greatest benefit can be derived if, from the great mass of experience of the many who are interested in safeguarding electricity in mines, a definite plan of common action can be evolved and a code of rules laid down, which in the opinion of all will bring about the safe conditions that all desire. If such a code were put into effect generally, its weak points could be strengthened from time to time by the common experience of many engineers and operators, who would be trying out

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*By H. H. Clark (paper read before A.I.M.E.).

the same requirements under various conditions. My experience and that of others reported to me leads me to believe that a code of rules would be welcomed by the underground electrical men who are to put them in force. These men, as a whole, desire to do things in the proper way, and would be glad to have the proper way pointed out to them. They enjoy arbitrary criticism as little as anyone, but I believe that most of them would appreciate constructive criticism and would co-operate in carrying out suggestions made by people in whom they have confidence. If such a movement could be started its difficulties would grow less as time went on, because the power of tradition is nearly as strong for good as it is for evil. The average electrical worker on the surface knows how to instal electrical apparatus, because he has been educated and guided by the Underwriters' rules, which have established a tradition for good work which cannot lightly be set aside. I wish to emphasise that the solution of this problem rests largely with the underground electrical worker. If good men are selected for this position and are properly instructed and encouraged to look out for the safety side of the electrical work, the problem is practically solved. *Electricity as a Safeguard.*—I believe that we shall see the day when electricity, so far from being considered a menace to those who work in mines, will be regarded as a means of safeguarding life and property and reducing the accidents that heretofore have occurred. Already there are certain electrical devices whose adoption and general use will make for safety. Among these are the telephone, the electrical shot-firing device, the storage-battery locomotive, and portable electric mine lamps. If the storage-battery locomotive can be developed so that it can successfully displace the trolley-wire locomotive, the greatest single cause of electrical accidents, the trolley wire, can be withdrawn from service at least to a large extent.

The One-Man Drill.

The importance to the Rand of discovering an efficient and economical one-man drill has always been borne in mind when the subject of future economies in working the banket beds has been brought up. Apart from the very vital considerations of cost of operating and construction of the machines there is a further important factor to be borne in mind in regard to miners' organisations and the standard of work and wages. While many miners object to the change from the two-man drill to the one-man drill, others who have been accustomed to the one-man drill prefer it for the reason that at most mines they earn more with the latter. In America all the mining companies insist that the one-man drill is an economic necessity. By using the one-man drill the output per miner is largely increased, and the mining companies give the miner the benefit of a part of the saving. A table prepared by the Calumet & Hecla Mining Company shows the number of tons of rock mined by miners employed by the company and its subsidiary companies using the one-man drill, and the number of tons mined by such miners using the two-man drill during the calendar year 1912. According to this statement the efficiency of miners was increased 33·90 per cent. in stoping, 90·60 per cent. in drift stoping, and 91·08 per cent. in drifting; and the earnings of miners were increased 7·47 per cent. in stoping, 21·31 per cent. in drift stoping, and 19·93 per cent. in drifting.

Transvaal Gold Trust.

The Blackhills Mine of the Transvaal Gold Trust is suffering from one of those setbacks to which, unfortunately, we are not unaccustomed—the caving in of some of the workings, owing to the protracted wet weather we have experienced of late, says the *Pilgrims Rest and Sabie News*. We are informed by the manager, Mr. L. W. Mucer, that they are closing down the mill temporarily, pending development operations, consequent on the falling in of some of the stopes. Mr. W. T. Hallimond, the well-known Rand consulting engineer, has been consulted, with the result above given. We trust that the mill will only be closed down for a brief period, for the winter is our best mining time, as it is the dry season. It is unfortunate that the setback has occurred now just at the commencement of the dry season.

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Finance, Commerce, and Industries.

Ocean Freights. The following communication has been received by the Rand Chamber of Commerce from the Chairman of the recently-formed South African Sea Freights Advisory Committee (Mr. K. Gundelfinger), viz.:—I beg to inform you that the South African Sea Freights Advisory Committee has been duly constituted and members have been appointed to it by the Association of Chambers of Commerce, by the Manufacturers' Associations, and by the South African Agricultural Union. The purpose underlying the movement, which has resulted in the constitution of this Advisory Committee, is that there should be in South Africa a body representative of South African interests that could speak with authority on all matters affecting shipping as they may arise from time to time. In the past such questions have been taken up by the South African Merchants' Committee in London, a body which has undoubtedly done good work, and will, it is hoped, continue to do good work in this direction in co-operation with the advisory committee. Some members of the South African Merchants' Committee are not in sufficiently close touch with South African affairs, and others have interests elsewhere. It has been felt that, owing to such causes, the Merchants' Committee in London could not bring to bear the same experience and unity of purpose as the Advisory Committee now constituted, whose members are resident in South Africa and in daily touch with local conditions and requirements. The advisory committee realises that if it is to fulfil its purpose it must act as the "clearing house," so to speak, of our South African problems relating to ocean freights, and that it can do so only if importing interests will submit their suggestions to it. The advisory committee intends dealing generally with questions appertaining to shipping, and especially with such questions as the rates of freight between South African ports and other ports of the world, and between South African ports themselves, and the provision of tonnage for special classes of cargo. Meetings of the committee will be called in Capetown immediately after the next Congress of the Association of Chambers of Commerce of South Africa. On behalf of the committee I beg to ask you to co-operate with it by referring to it any matters and questions coming to your notice which relate to ocean freights, to assist in the regulation of which the South African Sea Freights Advisory Committee has been called into being.

* * * *

Rand Produce Trade. Arising out of the recommendations of the Produce Trade Section of the Johannesburg Chamber of Commerce, correspondence has proceeded on a number of matters including the following, viz.:—(a) Mining Contracts for Maize: In compliance with the request of your committee the Chamber of Mines has made representations to the various mining groups recommending that tenders for maize should be thrown open to the trade, either through advertisement in the Press or through the Commercial Exchange. (b) Maize Export Regulations: In view of the fact that the Agricultural Department had been asked to adopt the system of grading at the ports "ex truck" instead of "ex floor," your committee addressed the Secretary for Agriculture urging that no alteration should be made in the present methods of grading till the proposals have been put before the several Chambers concerned and the Annual Maize Conference. The Secretary for Agriculture has replied, agreeing to this Chamber's recommendation (c) Forecast of Harvest: In reply to the Chamber's inquiry as to whether a forecast of the forthcoming harvest could be given, the Acting Director of Census wrote regretting his inability to furnish such a forecast. He added: "In the absence of legislative authority for the collection of general statistics, it has not been possible to take any active steps in this matter beyond preparing a draft scheme for the collection of agricultural and livestock statistics. It is the intention of the Government to introduce during the present session a Bill dealing with all classes of statistics." (d) New Season's Grades: Your committee represented to the Government the desirability of issuing the grade samples for maize export as early in the season as possible, and the Agricultural Department has replied that it is intended to standardise the 1914 season's maize grades soon after the crop is harvested and possible not later than 30th June. (e) Maize Contracts: Letters were addressed to the buyers for the military, the Government, the mining groups and the Municipality submitting the desirability, when obtaining tenders for the supply of maize, of arranging that quotations should be based on the Government Grader's samples of the season. The Government Controller of Supplies and the Rand Mines, Ltd., have among others, agreed to this; and the Assistant Director of Military Supplies has asked authority from the War Office to adopt the suggestion in respect of future contracts.

* * * *

It is understood that a well-known British firm of soap manufacturers, Messrs. Gossage, contemplate establishing a soap factory at Durban. Negotiations are being carried on for the purchase of ten acres of municipal land at Congella at £1,000 per acre.

MINING MEN AND MATTERS.

Mr. Thomas Douglas, Chartered Accountant, has entered into partnership with Mr. J. D. A. S. Low, Incorporated Accountant, for many years connected with the Consolidated Gold Fields of South Africa, Ltd., and from this date the business will be carried on under the style of Douglas, Low & Co.

* * * *

For family reasons the well-known firm of Mr. R. Hudson, of Gildersome, near Leeds, has been converted into a private limited company, under the style of "Robert Hudson, Limited." The business will, however, be carried on as before under the personal management of Mr. Percy Hudson, Mr. Walter S. Hudson, Mr. Robert A. Hudson, and Mr. Edward Hudson, who are permanent directors of the new company. Mr. R. A. Ironside is still general manager in South Africa.

* * * *

The next monthly meeting of members of the Geological Society will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 8th June, 1914, at 8.15 p.m. Business: The minutes of the ordinary monthly meeting held on the 20th April, 1914, will be read. The following papers will be open for discussion:—"Notes on some Prehistoric Stone Implements found in Katanga," by F. E. Studt, A.R.C.S.; "The Granite Dykes of the 3,520 ft. Level, Kimberley Mine," by E. H. L. Schwarz, A.R.C.S.; "Outlines of the Geology of German South-West Africa," by Eberhardt Rimann, Ph.D., M.E.M.Sc.; "The Occurrence of the Brazilian Trilobite *Pennaia* in the Bokkefeld Beds," by S. J. Shand, D.Sc., Ph.D.; "Note on Graphite-Coated Diamonds from the Premier Mine," by P. A. Wagner, D.Eng., D.Sc.; "Metasomatism in Banket," by R. B. Young, D.Sc.; "The Geology of a Portion of the Belingwe District of Southern Rhodesia," by P. A. Wagner, D.Eng., D.Sc. The following papers will be read:—"Note on Pyritic Concretions in Karoo Sandstones," by R. B. Young, D.Sc.; "Note on the Red Felspar of the Bushveld Tin Deposits," by David P. McDonald, M.A., B.Sc.

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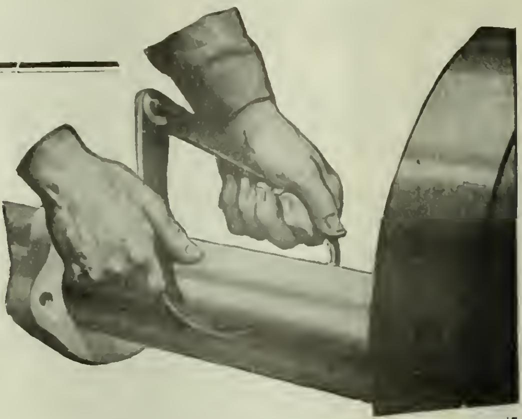

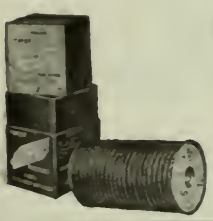

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THE WEEK IN THE SHAREMARKET.

Specialities in Demand—London Hesitating—Firmer Tone.

The market firmed up towards the end of the week, and several specialities were in considerable demand. Modder Deeps, State Mines, and Consolidated Langlaagtes enjoyed the most notable rises, and appear to be going better. All show improved quotations on the week, and this in face of a market otherwise none too active. The batch of annual statements presented this week is bound to produce a good effect, as apart from labour troubles it is shown that the mines were never in a sounder position. The Modder B. meeting proved a magnificent advertisement for the Rand, and the excellent announcements made at the Crown Mines and some of the Albu meetings cannot fail to accelerate the restoration of confidence in the Rand. In diamonds and tin there is still little doing, for obvious reasons. The price of De Beers' stones is said to have fallen 15 per cent. in London, and other and poorer varieties show even greater decreases.

* * * *

	Fri. 29th.	Sat. 30th	Mon. 1st.	Tues 2nd.	Wed. 3rd.	Thur. 4th.
Cinderella Deeps	4 9*	—	—	5 3*	5 3*	—
Adair-Ushers	0 5*	0 5*	—	—	—	0 5*
African Farms	10 6*	10 9*	—	10 9*	10 9	10 9
Apex Mines	—	—	—	—	15 0*	15 0*
Aurora Wests	—	9 0*	—	9 0*	9 0*	—
Bantjes Cons.	13 0*	—	—	—	—	—
Blaauwbosch Dias.	80 0*	—	—	80 0*	—	80 0*
Breyten Collieries.	26 6*	26 0*	—	26 0*	—	26 0*
Bushveld Tins	—	—	—	0 6*	0 6*	0 6*
Cassel Coals	—	15 0*	—	—	—	—
City and Subs.	49 0*	49 0*	—	49 3*	49 6*	49 6*
City Deeps	64 6*	64 9*	—	64 6*	64 6*	64 6*
Cloverfield Mines	4 0*	4 1*	—	4 1*	4 1*	4 1*
Clydesdale Collieries	—	—	—	—	9 3*	—
Con. Langlaagtes.	—	33 0*	—	33 0*	33 0*	33 3*
Con. Main Reefs.	17 0*	17 0*	—	17 0*	17 4*	17 4*
Coronation Collieries	20 0†	19 0*	—	19 0*	21 0†	19 0*
Coronation Freeholds	—	0 4*	—	0 4*	0 4*	0 4*
Crown Diamonds	5 6†	4 0*	—	5 0†	3 9*	5 0†
Crown Mines Debs.	—	—	—	—	—	£97*
Durban Roodepoorts	—	22 6*	—	—	—	—
Durban Rood. Deeps.	17 0*	17 0*	—	17 6†	17 0*	17 6*
East Rand Centrals	1 9*	1 9*	—	1 9*	—	1 9*
East Rand Coals	1 7*	1 6*	—	1 7*	1 7*	1 7*
East Rand Deeps	1 5*	1 5*	—	1 5*	1 6*	1 6*
East Rand Props.	—	30 9*	—	31 0	31 0*	31 0*
East Rand Debs.	£87*	—	—	—	£88*	£89*
Eastern Golds.	1 0*	0 10*	—	—	1 0*	1 0*
Frank Smiths	3 3*	3 3	—	3 3	3 4	3 3
Geduld Props.	22 9*	22 9*	—	22 9*	23 0*	23 0
Geldenhuis Deeps	—	—	—	25 0†	—	22 6*
Glencoe Collieries	—	6 6	—	6 3*	—	6 0*
Glynn's Lydenburgs	—	—	—	10 0*	10 0*	10 0*
Govt. Areas	19 9*	20 0*	—	20 3	20 4	20 9
Joh. Bd. of Ex.	23 9†	23 9†	—	—	—	23 9†
Jupiters	4 6†	4 0*	—	4 3*	4 3	—
Kaalfontein Dias.	0 3*	—	—	0 3*	0 5†	—
Klerksdorp Props.	2 6	2 6*	—	2 6*	2 6*	2 6*
Knight Centrals	7 9*	7 6*	—	7 8	7 8	7 6
Knights Deeps	—	—	—	—	—	33 6†
Lace Props.	3 0*	3 0*	—	3 0*	3 0*	3 0*
Luipaardsvlei Est.	9 6*	9 6*	—	9 6*	9 6*	9 9
Lydenburg Farms	2 6*	—	—	2 6*	2 6*	2 6*
Main Reef Wests	6 0*	6 0*	—	6 0*	6 3*	6 0*
Meyer & Charltons	113 9*	115 0*	—	115 0*	115 0*	116 0*
Middelvlei Estates	1 0*	1 1*	—	1 0*	1 0*	1 0*
Modder B.'s.	84 0*	84 6*	—	84 0*	—	—
Modder Deeps	49 0*	49 6*	—	51 0	53 0	54 3
Natal Navig. Col.	—	15 0*	—	—	—	—
New Boksburgs	0 9*	0 9*	—	—	0 9*	—
New Eland Diamonds	—	—	—	—	—	30 0†
New Era Cons.	5 6*	—	—	—	—	—
New Geduld Deeps	—	1 6*	—	—	—	—
New Gochs	14 0*	14 6*	—	15 0*	—	14 6*
New Heriots	—	—	—	—	—	54 0*
New Kleinfonteins	22 0*	22 0*	—	21 6*	21 3*	21 3*
New Modders	252 6*	252 6*	—	252 6*	253 9*	253 9*
New Rietfonteins	—	2 6*	—	2 6*	—	2 6*
New Unifieds	16 0*	16 0*	—	—	16 0*	—
Orange Diamonds	1 2*	1 2*	—	1 1	1 2	1 1*
Pigg's Peak	9 9*	9 9*	—	9 9*	9 9*	9 9*
Pretoria Cements	45 6*	46 0*	—	46 0*	45 6*	45 6*
Princess Estates	4 9*	—	—	1 6*	—	—
Rand Klips	2 4*	2 4*	—	2 4*	2 3*	2 3*

*Buyers. †Sellers

	Fri. 29th.	Sat. 30th.	Mon. 1st.	Tues. 2nd.	Wed. 3rd.	Thur. 4th.
Rand Nucleus	1 7*	1 7*	—	1 7*	1 7*	1 7*
Randfontein Deeps	3 0*	3 4*	—	3 3*	3 3*	3 3*
Randfontein Estates	20 3*	20 9†	—	20 3*	20 3*	20 0*
Roberts Victors	15 0*	—	—	15 0*	15 0*	15 0*
Robinson Deeps	30 0†	30 0†	—	—	—	—
Rooibergs	21 6	—	—	20 0*	21 0*	20 0*
Ryan Nigels	3 0†	2 6*	—	2 6*	3 0†	2 9*
Shebas	4 6*	4 6*	—	4 6	4 3*	—
S.A. Lands	2 5*	2 5*	—	—	2 6*	2 5*
Springs Mines	—	11 0†	—	11 0†	11 0†	11 0†
Sub-Nigels	11 6	10 6*	—	10 0*	10 3*	—
Swaziland Tins	31 6†	30 0†	—	—	—	30 0†
Trans. Coal Trusts	26 6*	26 6*	—	26 6*	27 0	26 0*
Trans. G.M. Estates.	—	36 0*	—	—	37 0*	—
Van Ryn Deeps	44 6	44 6*	—	45 3	45 3	45 3
Village Deeps	—	38 0	—	—	37 9*	37 9*
Vogel Con. Deeps	1 0†	1 0†	—	1 0†	—	1 0†
West Rand Cons.	8 0*	8 3*	—	8 6*	8 6*	8 6*
Western Rand Est.	2 6†	—	—	2 6†	2 0*	2 6†
Witbank Collieries	43 0*	43 0*	—	43 6*	43 6*	43 6*
Witwatersrands	69 0*	68 9*	—	68 9*	69 0*	69 0*
Wit. Deeps	51 6*	51 6*	—	—	52 0*	52 3*
Wolhuters	13 6*	13 6*	—	13 6*	14 0	13 9*
Zaaiplaats Tins	24 0*	24 3	—	24 3*	25 0	24 3*
Trans. and Delagoa.	—	50 0†	—	—	—	—
Village Main Reefs	—	—	—	34 0*	34 0*	34 0*

*Buyers. †Sellers.

Frank Smith Diamonds.

For the month of May the results were as follows:—53,200 loads treated yielded 1,772 carats. Recoveries for the previous three months:—February, 2,160 carats; March, 2,503 carats; April, 2,060 carats.

Defunct Companies.

In accordance with Section 196 (5) of the Companies Act, 1909 (No. 31 of 1909), the names of the undermentioned companies have been struck off the register and the companies dissolved.

No.	Name of Company.	Date of Registration.
37	Albion Gold Mining Company, Limited	25 3 1889
311	Algemeene Exploitatie en Bouw Maatschappij, Beperkt	3 5 1889
1477	The African Wigan Colliery Syndicate	10 10 1897
1686	African Diamonds, Limited	29 3 1902
1765	Allewyns Poort Mining and Water Rights Syndicate, Limited	10 9 1902
1870	African Development Syndicate, Limited	3 3 1903
1926	Aberfeldy Diamond and Developing Company, Limited	1 5 1903
2082	National Options Syndicate, Limited	8 4 1904
2333	African Tin, Copper, and Diamond Exploration Syndicate, Limited	12 5 1905
2143	Albion Diamonds, Limited . ..	2 12 1905
2563	Norseman Diamonds, Limited	30 8 1906
2633	The Pepita Prospecting Syndicate, Limited ..	19 11 1906
2902	The Acorn Gold Mining Syndicate, Limited ..	15 1 1908
3190	African Produce and Wood Company, Limited ..	23 7 1909
3208	African Chemical Works, Limited	31 8 1909
3277	The Pilgrims Creek Claim Syndicate, Limited	24 12 1909
3766	Orpheum Theatre Company, Limited ..	8 6 1911
3771	M. A. Kalter, Limited	24 6 1911
3799	Sands, Limited	25 7 1911
3860	Africa's Amalgamated Theatres, Limited	31 10 1911
3871	Tin Lands, Limited	11 11 1911
3882	Alfreditis, Limited . . .	28 11 1911
3951	El Oro (Transvaal) Gold, Limited .	8 3 1913
4076	Breyten Hotel and Bottle Store, Limited	4 10 1912
3319	Union Bioscope Company, Limited .	25 2 1910

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GRADE, COSTS, AND PROFITS IN APRIL.

Chamber of Mines' Analysis.

THE following tabulation of the operations of the mines of the Transvaal contributing to the gold production is supplementary to the details published by the Chamber of Mines in its declaration on the 9th of the month:

THE WITWATERSRAND.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United ...	11,702	26	11	33	5	14,559	*2,848	*6	7
2. Bantjes Consolidated ...	27,644	24	9	20	6	22,885	4,440	4	3
3. Brakpan Mines	66,192	28	8	20	9	47,419	18,194	7	11
4. City Deep	84,415	40	1	23	0	47,668	34,608	16	8
5. City and Suburban	49,558	37	9	22	7	28,192	20,573	16	5
6. Cons. Langlaagte	58,750	24	5	15	3	35,895	22,609	9	7
7. Cons. Main Reef	31,998	31	7	21	7	21,918	9,745	9	7
8. Crown Mines	247,001	26	10	15	8	144,439	99,841	10	10
9. Durban Roodepoort ...	14,468	20	9	15	3	10,654	3,815	5	5
10. Durban Rood. Deep ...	33,799	27	3	23	7	29,323	4,073	3	3
11. East Rand Proprietary	213,387	29	2	20	10	145,923	56,185	8	0
12. Ferreira Deep	105,463	38	10	17	9	48,126	55,877	20	8
13. Geduld Proprietary ...	28,286	32	8	25	7	22,149	6,067	7	0
14. Geldenhuis Deep	67,683	28	2	23	4	55,945	11,014	4	7
15. Ginsberg	17,981	24	6	18	5	13,382	4,396	6	1
16 Glencairn Main Reef ...	15,084	14	0	11	10	12,078	2,275	2	2
17. Knight Central	23,078	24	1	20	9	19,792	3,001	3	2
18. Knights Deep	69,454	13	0	11	5	58,956	9,619	1	10
19. Langlaagte Estate	58,157	21	10	18	0	42,428	15,039	6	5
20. Luipaardsvlei Estate ...	18,788	21	4	18	1	15,840	2,730	3	1
21. Main Reef West	24,216	26	9	22	0	19,917	4,024	4	5
22. May Consolidated	8,835	15	11	14	11	8,270	546	1	0
23. Meyer and Charlton ...	34,326	46	7	16	7	12,257	22,176	30	1
24. Modderfontein B.	61,431	35	11	15	6	26,504	34,258	20	0
25. New Goch ...	32,206	22	0	14	7	21,413	10,708	7	4
26. New Heriot	23,456	36	4	21	2	13,624	9,582	14	10
27. New Kleinfontein.	68,970	26	10	17	9	45,685	22 545	8	9
28. New Modderfontein ..	92,558	36	4	15	2	38,612	52,991	20	9
29. New Primrose	26,119	22	7	12	11	14,758	11,065	9	8
30. New Rietfontein	6,643	20	0	17	8	5,852	791	2	5
31. New Unified ..	14,085	21	4	14	5	8,949	4,891	7	10
32. Nourse Mines	57,693	26	6	20	0	43,452	13,646	6	3
33. Princess Estate	28,557	25	5	23	5	26,373	2,115	1	11
34. Randfontein Central	243,353	22	11	16	5	172,147	71,277	6	10
35. Robinson	87,346	34	5	14	3	35,815	49,848	19	10
36. Robinson Deep	58 933	26	5	15	10	35,389	25,001	11	2
37 Roodepoort United . .	21,888	18	11	18	3	21,030	948	0	10
38. Rose Deep . . .	84,793	25	8	16	1	53,035	30,873	9	4
39 Simmer and Jack	60,823	17	11	11	10	40,181	22,292	6	7
40. Simmer Deep . .	40,515	16	3	15	1	37,612	2,446	1	0
41 Spes Bona Tribute†	5,114	18	1	—		—	—	—	
42. Van Ryn	54,048	28	0	16	1	31,041	23,078	11	11
43. Van Ryn Deep .	66,260	33	2	17	5	34,840	31,419	15	9
44 Village Deep	70 262	27	11	16	10	42,285	27,158	10	10
45. Village Main Reef	63,745	42	5	19	1	28,752	33,428	22	3
46. Vogelstruis Estate	14,472	22	9	20	5	13,043	1,461	2	4
47 West Rand Central	4,167	35	9	25	11	3,140	1,029	8	10
48 West Rand Cons.	33,638	25	6	19	11	26 025	7,659	5	10
49. Witwatersrand	47,676	24	10	13	8	26,246	21,431	11	2
50. Witwatersrand Deep ...	56,431	27	4	16	8	34,340	21,441	10	5
51. Wolhuter	42,239	25	4	16	8	27,519	14,220	8	7
Miscellaneous producers	6.968	—		—		—	—	—	
Witwatersrand totals	2784842	26	6	17	3	1785671	955600	9	3
*Loss. †Private.				50 cos.		50 cos.	50 cos.	50 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
HEIDELBERG—									
1. Nigel	19,930	30	6	26	3	16.676	3,031	4	9
2. Sub Nigel	9.222	40	1	32	3	7,413	1,699	7	5
BARBERTON—									
3. Barrett	1,134	7	10	—		—	—	—	
4. Sheba	13,780	43	0	30	4	9,575	4,204	13	4
5. Worcester	3,959	13	2	11	8	3,500	432	1	5
KLERKSDORP—									
6. Quest	2,808	13	3	11	6	2,431	379	1	9
LYDENBURG—									
7. Ceylon Lydenburg . ..	1,058	32	7	27	11	908	134	4	1
8. Glynn's Lydenburg	8,678	44	11	18	4	3,550	5,052	26	2
9. Transvaal G.M. Estates	35,881	52	2	22	11	15,724	19,699	28	8
Miscellaneous producers	23,632	—		—		—	—	—	
Total (outside districts)	120,082	34	9	22	11	59,777	34.630	13	4
				8 cos.		8 cos.		8 cos.	8 cos.
Grand totals . .	2904924	26	8	17	5	1845448	990230	9	4
				58 cos.		58 cos.	58 cos.	58 cos.	

A process whereby steel is hardened by means of compressed air is now in use by a German firm in cases where only certain parts of the metal require hardening. The customary methods of hardening by chilling the steel in water, oil, or special baths is not satisfactory in such cases, owing to the tension created between the hardened and unhardened portions of the treated metal. In the new procedure the compressed air is sprayed over the metal through specially designed nozzles, by means of which, by varying the number and spacing of the openings, the degree of hardening may be accurately graded. The claim is made that a wide range of results can be obtained by adapting the shape of the nozzle to that of the work.—*Journal of Industrial and Engineering Chemistry.*

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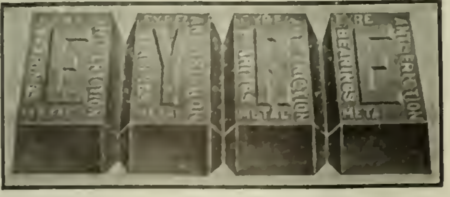

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UNION LAWS AFFECTING COMMERCIAL TRAVELLERS.

Regulations in the Union—Points from an Important Bluebook.

A BLUE BOOK of particular interest to large firms with clients extending over a considerable area has just been published in the shape of a memorandum summarising the regulations in force in the British Oversea Possessions, and in foreign countries with regard to British commercial travellers. In synoptical form the regulations existing in the Union of South Africa are that under ordinary circumstances duty is levied on all samples imported by commercial travellers if they have any intrinsic value (cut samples of woollen or cotten piece goods or of floor cloth, etc., would not be regarded as being of any value). The duty paid at the port of entry is refunded on satisfactory proof of re-shipment provided that the owner has complied in full with the Customs Union Regulations. Re-shipment must, however, take place within one year from the date of first importation in order to obtain a refund of duty. It is not necessary that such re-shipment shall take place at the port of original entry, but when made at a port other than that at which the duty was paid, a certificate under the hand of the Customs authorities at the port of shipment must accompany the application for a refund of duty. To obtain the concession referred to the samples must be bona fide, that is, they must not represent large consignments, brought out by the representative of a firm, who merely travels round disposing of as much as possible and desiring to obtain a refund of duty on the unsold balance of his stock; in other words, the samples must be merely exhibits for the purpose of taking orders and not be articles for sale.

OUTSIDE THE UNION.

Further, commercial travellers who have paid deposits on their samples at any port in the Union of South Africa, and then proceed to Rhodesia, may on leaving Rhodesia at Bulawayo or Umtali, with a view to embarkation at Beira, secure a refund of the deposits at those places after the Collector of Customs has satisfied himself that the samples presented agree with those on which deposits were originally paid, the duty on any article which may have been disposed of or may be missing being deducted. The 3 per cent. transit duty, formerly required in respect of commercial travellers' samples passing through Portuguese East Africa, either to or from British territory, is not now levied. Commercial travellers wishing to remove their samples from one Colony to another within the South African Customs Union must obtain permits in prescribed form from the Customs authorities. A permit is available for one journey only, and must be handed in to the Customs in the Colony of issue immediately on return. Arrangements have been made whereby samples taken to South Africa by British commercial travellers may be presented to the Customs authorities in the United Kingdom for examination, and may be plombed by them in order to obviate examination on the other side. A list and description of the samples must be drawn up and attested by the Customs authorities. On the lines of the South African Government Railways commercial travellers are allowed double the weight of free luggage permitted in the case of ordinary passengers, and are also allowed to carry an excess weight, up to a total of 1,500 lbs., at half parcel rate on production of concession orders signed by a District Transportation Officer. The luggage must consist of personal luggage or samples intended solely for display and not for sale.

CAPE PROVINCE.

In the Cape Province all commercial travellers are required to take out a licence as agent for a foreign firm; the "foreign firm" in this sense being regarded as a firm outside the Colony. The licence referred to costs £50 per annum or £25 per half year if only one firm is represented, and £5 or £2 10s. respectively, for every additional firm up to a maximum of £100 or £50 respectively. Half yearly licences can only be taken out after June 30th. The licences are personal to the holder, but may be transferred in certain special cases. All licences expire on December 31st. If the agent has been resident in South Africa for at least three years immediately prior to his application for a licence, half the above rates would be payable. No licences are required by provincial or municipal authorities as distinct from the Government licences, which enable the agent to exercise his calling in any part of the Province. Every person, other than an importer, who sells or offers for sale by sample or otherwise goods of, or canvasses for, a firm whose place of business is not in this Province, is deemed to be an agent of a foreign firm. The deputies of such agents must also take out licences. If the traveller sells the samples of goods which he carries, he would require a hawker's licence in addition to that as agent for a foreign firm. If he opens sample rooms and does not carry the goods about with him but effects sales from his rooms, a general dealer's licence would be necessary. Principals of firms merely visiting their customers without taking orders would not require a licence. Commercial travellers are not personally liable to income tax in respect of the sales they effect, but agents in the Cape Province can be assessed on their earnings as agents.

NATAL.

A commercial traveller "being the agent or representative who in Natal solicits orders for the purchase of the goods or things of any person, firm, or company, which does not itself carry on a licensed business and also have a licence in Natal" is required to take out an annual licence bearing a stamp value £10. All licences expire on December 31st; if taken out after June 30th, £6 only is charged. Commercial travellers are subject to income tax on all income earned in Natal, and, if resident in Natal, on income earned outside Natal also. The traveller is not taxable on the amount of the sales he effects (the tax on the profits of those sales falls on the principal), but on the net amount of all personal profit earned by him. If his principal is resident abroad, he may be taxed as agent for that principal on the profits of the sales effected by him in Natal, and may recover from the principal or deduct the tax from money belonging to the principal in his possession. On the Natal Government Railways commercial travellers, on production of credentials, are allowed double the weight of free luggage granted to ordinary passengers, and excess weights are charged at half parcels rates. Their luggage must consist of personal luggage or samples intended solely for display and not for selling purposes. Such luggage may be booked through to ultimate destination, but it must accompany the passenger and not precede or follow him. As regards taxes payable by resident representatives of firms and companies not domiciles in Natal, "an agent (not being a commercial traveller) whether law agent, forwarding agent, broker, land and estate agent, or other agent," is required to take out an annual licence bearing a stamp value £5. "A joint stock company, being any company, syndicate, or association of persons, having its capital divided into shares for the transfer of which the express consent of all the members is not necessary and carrying on its business, or any part thereof, or having any office or place of business within the Colony," must take out an annual licence, bearing stamps of the value of £1 (not, however, in any case exceeding £50 or being less than £1) for every £1.000 or fraction of £1,000 of paid up capital. If any company proves that its total receipts within Natal for the half-year preceding have not exceeded £1,000, stamp duty does not exceed £10. If the total receipts have not exceeded £2,000, duty does not exceed £20. It is noteworthy that licences of all kinds expire on December 31st of the year in which they are taken out; provided, however, that a stamp of three-fifths of the value specified is sufficient for licences duly taken out on and after July 1st in any year.

ORANGE FREE STATE.

In the Orange Free State all commercial travellers are required to take out a licence which, for trade or general merchandise, costs £5, and is available for three months; a licence to sell liquor, however,

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costs £2[illegible] for three months. No separate municipal or provincial licences are required. The licences are personal and, consequently, the traveller may represent any number of firms under one licence. Travellers selling samples would require a hawker's licence or a general dealer's licence, the former if the goods were sold at the customer's premises and the latter if at their own premises. The hawker's licence, however, would not permit them to sell in a town. Principals as well as employees require licences if they take orders, but not if they merely visit their customers. Commercial travellers are not subject to income tax on the sales effected by them. Certain special facilities are granted to commercial travellers on the railways. All commercial travellers visiting the Transvaal are required to take out a licence at a cost of £10 yearly or £6 half yearly. All licences expire on December 31st. This licence is obtainable from any Receiver of Revenue, and, being personal to the traveller, enables him to represent any number of firms. No separate municipal or provincial licences are required. A principal of a firm soliciting, receiving, or taking orders would be regarded as the agent or representative of the firm, and would be required to take out a licence. If a practice were made of selling samples the Revenue Department would require that a hawker's licence or general dealer's licence should be taken out. No income tax is leviable in the Transvaal.

RHODESIAN LICENCES.

With respect to the licence payable in the Chartered Company's territory by commercial travellers and agents representing business houses domiciled outside of Rhodesia is £30 per annum. This licence is not payable by a firm as such, but each representative of such firm is required to obtain it before pursuing his business. Commercial travellers, on production of credentials as to their bona fides, are allowed double the weight of free luggage granted to ordinary passengers on the railways, and excess weights are charged half parcel rates; provided such luggage consists of samples intended solely for display and not for sale purposes, and accompanies the traveller. Under no circumstances will the railways accept responsibility for loss of trade, business market, or for any expenses incurred in consequence of any delay or damage to, or loss of, travellers' samples or luggage. The maximum amount of luggage, including samples, which a commercial traveller may have conveyed by passenger train is 1,500 lbs., unless the acceptance of more than that quantity will not interfere with the conveyance of other passengers' luggage. Provided the owner produces a railway ticket showing the ultimate destination, the luggage may be booked through to such a destination—mileage for branch lines being included in the calculation—but it must accompany the passenger, and not precede, or follow him to destination. In such cases, travellers will be allowed to take their luggage away at stations where they break their journey. Any contravention by firms or their representatives of the conditions imposed by the railways will result in the forfeiture of all privileges granted to commercial travellers. Sample bicycles, limited to two, accompanying a commercial traveller, are charged by weight, as in the case of ordinary samples, instead of the special rates provided for bicycles. This concession does not apply to managers, partners, agents or resident representatives of firms who travel as commercial travellers.

MADAGASCAR.

Commercial travellers visiting Madagascar are required to pay a tax at the rate of 13s. 4d. for every month or part of a month they stay in the island. The tax must be paid on landing, and a licence must be obtained from the local Administrator.

No special regulations or taxes exist in regard to commercial travellers visiting the Gold Coast, Gambia, East African Protectorate, Mauritius, Northern Nigeria, Nyasaland Protectorate, St. Helena, Southern Nigeria, Sierra Leone, Uganda, Zanzibar, etc., though in most cases travellers' samples offered for sale are liable to taxation, and on certain articles, such as alcoholic liquors, there is duty.

RAND MINES, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Nineteenth Ordinary General Meeting of Shareholders for the year ended 31st December, 1913, will be held in the Board Room, The Corner House, Johannesburg, **on Wednesday, 10th June, 1914, at 11 a.m.**, for the following business:—

1. To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1913, and the Reports of the Directors and Auditors.
2. To elect Directors in the place of those retiring in accordance with the provisions of the Company's Articles of Association.
3. To determine the remuneration of the Auditors for the past audit and to appoint Auditors for the ensuing year.
4. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under consideration by the Report of the Directors.

The Share Transfer Books of the Company will be closed from the 1[illegible]th June, 1914, to the 16th June, 1914, both days inclusive.

Holders of Share Warrants to Bearer who desire to be present or represented at the Meeting must deposit their Share Warrants (or may at their option produce same) at the places and within the times following:—

(a) At the Head Office of the Company in Johannesburg, at least 24 hours before the time appointed for the holding of the Meeting.

(b) At the London Office of the Company, No. 1, London Wall Buildings, London, E.C., at least thirty days before the date appointed for the holding of the Meeting.

(c) At the Office of the Credit Mobilier Francais, 30 and 32, Rue Taitbout, Paris, at least thirty days before the date appointed for the holding of the Meeting,

and shall otherwise comply with the "Conditions as to the issue of Share Warrants or Bearer Shares" now in force.

Upon such production or deposit a Certificate, with Proxy Form, will be issued under which such Bearer Warrant holders may attend the Meeting either in person or by proxy.

By Order of the Board.

H. A. READ, Joint Secretary.

Head Office: The Corner House,
Johannesburg, Transvaal,
15th April, 1914.

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(REGISTERED IN ENGLAND.)

NOTICE IS HEREBY GIVEN that an Eightieth (80) Interim Dividend of Ten per cent. (10%), equal to 2s. (Two shillings) per share, has been declared, payable on and after the 27th of June, 1914.

Holders of Shares to Bearer should present Coupon No. 80 for payment of the above 2s. (Two shillings) per share at the Standard Bank of South Africa, Ltd., Johannesburg Branch, on and after the 27th of June, 1914.

W. A. MARTIN,
W. MACFARLANE,
L. CLARENCE,
Local Directors.

Johannesburg, 22nd May, 1914.

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ESTABLISHED 1891.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

CONTENTS.

PAGE
Notes and News ... 419
Topics of the Week:
The Rand Mines' Year ... 421
Rand Values in Depth ... 422
Activity in the Pilgrims Rest Area ... 423
Gold Dredging in Southern Africa ... 424
The Manager and Staff of the Nigel G.M. Co., Ltd. ... 425
The True Functions of the "Capital Account" ... 426
The Mining Position in Madagascar ... 427
Tin Deposits near Capetown ... 428
Excellent Outputs and Profits in May ... 429
Correspondence and Discussion: "First Aid v. Safety First" ... 430
The May Gold Output in Detail ... 431
Rhodesian section:
Latest Mining News ... 434
Engineering Notes and News ... 435
The Week in the Sharemarket ... 438
Finance, Commerce and Industries ... 437
Mining Men and Matters ... 438
Company Meetings: Geldenhuis Deep; Knight Central; Rose Deep; City Deep; Rand Mines ... i.

Notes and News.

The Half-Year's Dividends.

The first batch of the half-year's dividends has come to hand in the shape of substantial declarations from six mines under Corner House control. The City Deep announces the distribution of £140,625 (11¼ per cent.) as compared with £93,750 in December last, whilst the amount to be paid out by the Village Deep—ten per cent. on a capital of £1,060,671, is double that announced six months ago. The Robinson's declaration of 9 per cent. is 1 per cent. better than in December. The Robinson board of directors have considered the distribution of a cash bonus of 10s. per share to shareholders registered in the books of the company at the close of business on 30th June, 1914, and to holders of Coupon No. 39 attached to share warrants, to be paid simultaneously with the dividend on 5th August, 1914, but have delayed action pending the election of the board of directors at the annual general meeting, which will be held on the 30th of June, 1914. The dividends of the Bantjes 2½ per cent., New Modderfontein 15 per cent., and Modder B. 25 per cent., are at the same rate as announced six months ago. In the outside mines the Sheba announces 5 per cent.

* * * *

Rand Ore Reserves.

The subject of aggregate ore reserves naturally always appeals strongly to those interested in the Witwatersrand, and indeed to all who are concerned with the welfare of this country at large, since the tonnages of banket ore blocked out represent the stock-in-trade of the industry on which the future of South Africa so largely depends. We observe that the table of the Rand's ore reserves appearing in this journal a few weeks ago is given prominence in some of the London papers to hand by this mail. Mr. Schumacher directed further attention to the unquestionable stability of the underground positions of Witwatersrand mines in his speech at the annual meeting of Rand Mines, Ltd., on Wednesday. In the course of his remarks Mr. Schumacher stated that the ore reserves of twelve companies in which the Rand Mines, Ltd., is largely interested amounted at the end of the year to 32,153,560 tons, and that they contained gold of a value of £48,903,000. In addition, there is estimated to be contained in safety and boundary pillars a further £4,967,000, which will eventually be recovered. The grand total of developed gold in these dozen ventures may thus be stated at £53,870,000, or over 55 per cent. of the total annual output of the world! Figures such as these cannot fail to convince sceptics who are prepared to be convinced that the Rand after all is not going down hill.

* * * *

Mr. Schumacher and the Government Areas.

Mr. Schumacher's speech at the annual dinner of the Cornish Association last Saturday contained an interesting and important suggestion. If the Government, he said, cared to run a portion of the Far East Rand as a State-controlled mine, it would have nothing but sympathy from the rest of the industry. Mr. Schumacher's suggestion merits careful consideration, and we for our part would heartily welcome any scheme that would enable the small investor in this country to increase his direct interest in the Rand. We hope next week to give the proposal more extended treatment.

* * * *

Select Committee's Report on Miners' Phthisis.

The report of the Select Committee on the Miners' Phthisis Act, issued this week, is full of valuable recommendations for improving the machinery of the Act and increasing its beneficial influence. The staff and accommodation of the Phthisis Compensation Board are to be reorganised and improved, not a moment too soon. Numerous minor alterations in the text of the Act are recommended, the effect of which it is too early to foresee. Undoubtedly the most important change contemplated is in the direction of practically doubling the amount payable to sufferers in Class A. This has been advocated by members on all sides of the House of Assembly, as one of the lessons learned from the first year's working of the Act, and it seems a just and generous step. Likewise the provision of a special fund for helping widows of victims, who failed to come under the Act, is to be commended. Private and indiscriminate charity will be thus relieved. The report also contains valuable, practical recommendations to the Government in the direction of widening the sphere of usefulness of the Phthisis Board. That the disease is being well taken in hand is shown by the following passage: " While the figures supplied by the Board do not indicate any diminution since the commencement of the Act in the number of applications for compensation, the evidence of the members of the Medical Advisory Committee was more reassuring. The majority of the witnesses were agreed that we are still suffering from the accumulation of cases of the disease contracted during the time when little was done on the mines towards its prevention, and that the time which has elapsed since strenuous steps were adopted towards that end is too short to make itself sensibly felt in the statistics. The Committee notes with great satisfaction that the officials of the Mines Department, of the Chamber of Mines, of the men, and of the Medical Advisory Committee were unanimous in their testimony regarding the marked improvement which has been effected in underground conditions both in respect to dust prevention and ventilation, and in regard to the hearty and much-to-be-desired co-operation of officials and men in bettering conditions, and hopes that the effect of these beneficial efforts will in the immediate future be reflected in a great diminution of the incidence of the disease."

* * * *

The Cost of Phthisis. In the course of the Select Committee's report on Miners' Phthisis, it is shown that the awards made against the compensation fund from the 1st August, 1912, to the 30th April, 1914, amounted to £1,308,541, which figure includes £23,010 on account of allowances under Act No. 34 of 1911, and there was paid out during this period on account of these awards £692,058, and £11,405 on account of allowances under the Act of 1911. It must be understood that the compensation fund will remain liable after August 1st, 1914, in respect of awards, whether of original applicants or their dependants made on applications received prior to that date. The insurance fund will start on the 1st August, 1914, with an accumulated balance of £400,000. If the new awards continue to be made at the same rates as at present it would appear that the fund will be inadequate to meet the demands made on it. The Committee, however, for reasons given elsewhere in its report, hopes for a material reduction in the number of awards, and the question of solvency depends entirely on whether this anticipation is or is not realised. The total amount paid by mining companies to the compensation fund from the commencement of the Act of 1911 to the end of May, 1914, was £725,000; the total amount paid to the insurance fund under the Act of 1912 was £163,000 by the mining companies and £163,000 by the men. The unexpended balance of the grant of £100,000 by the Government at that date was £40,000.

* * * *

Free State Banket. The fourth ordinary general meeting of the Free State Banket Development Company, Ltd., was held in mail week at the offices of the company, 85, London Wall, E.C. Mr. Arthur Pratt presided, and, in moving the adoption of the report for 1913, observed that recently the Pendon claims, upon which favourable developments had taken place, had been let on tribute for a period of five years with the right of re-entry on equitable terms. The report was adopted.

* * * *

Rocdepoort United. The Roodepoort United has lately gone through a trying time, but its luck seems to be improving since the recent change of management. At the annual meeting the other day, Sir George Albu explained very clearly the various troubles that had affected the mine, and had upset calculations during the past year. The chances, said Sir George, were if anything in favour of an improvement in grade, as it seemed pretty certain they were not likely to meet with lower grade ore on the average than had recently been crushed. There is, of course, a distinct possibility of better values in depth. Moreover, material working economies are possible, and already we understand the efforts put forth in this direction promise well for improving the net results.

* * * *

A New Kleinfontein Share Issue? It is rumoured in London that the New Kleinfontein Co. is about to issue 100,000 shares, though nothing is known officially. Examination of the position suggests that the provision of £100,000 just now would greatly facilitate the operations of the company. It will be recollected that the assets taken over from the Benoni Company included a 55-stamp mill with sands and slimes works, which were shut down after a short run. To make the alterations necessary to the latter, increase its capacity from 20,000 to 25,000 tons per month, and provide for the supply of ore from the Benoni mine, will, the consulting engineer estimates, cost £100,000. This would make the total crushing capacity of the Kleinfontein 75,000 tons per month.

* * * *

The United States Bureau of Mines. We have received a copy of the third annual report of the United States Bureau of Mines, which covers the fiscal year ended on June 30, 1913, and shows the character of the work done since the Bureau was established in July, 1910. That work has been mainly the investigation of problems that have to do with the causes and prevention of coal mine explosions and the safeguarding of the lives of miners. In addition, much has been done in the way of analysing and testing coal and other mineral fuels. One beneficial result from the work of the Bureau is that it encourages research and inspection, the purchase of mine rescue and first-aid equipment, and the maintenance of mine rescue corps by the private mining companies. At the time the Bureau first undertook the development of modern protective methods, there were in the United States only a few sets of breathing apparatus. There are now owned and in use by 170 private mining companies 76 rescue stations and about 1,200 sets of such apparatus. A revolution has been brought about in the explosives used in coal mines containing inflammable gas or dust. At the time of the inauguration of the work black powder, with its long flame and poisonous gases, was almost universally used in coal mining operations in the United States, but so rapid has been the introduction of permissible explosives that during 1912 more than 18,000,000 lbs. were used.

* * * *

Rezende Results. There was a further increase last year in the earnings of the Rezende Mines, which, it may be remembered, took over the Penhalonga claims in May, 1912. The annual report shows that, although the Penhalonga section produced less than before, the 1913 profit exceeded that for the previous twelve months, there having been an improvement in the Rezende returns and an increase in the amount received by the company from tributors. The 1913 profit and loss account shows a credit balance of £28,780, as compared with £22,240 for 1912, but the directors have not raised the dividend rate, the distributions totalling 15 per cent. for each of the last two years. An increase in the total ore reserve tonnage is disclosed, due to the inclusion of a considerably larger quantity of the low grade material in what are described as the old west workings.

* * * *

Moving Pictures and Accident Prevention. What more natural than that the moving picture with its abundant applications should be called to the service of the mines management in delivering practical lessons to its workmen? This modern device has been introduced in various ways, and it is expected that the " Safety First " people will adopt it as a means of teaching the public in the matter of mine dangers. An example of the use of the moving picture is described in the *Colliery Engineer* for March. It was installed by the United States Coal and Coke Co. at Gary, W. Va., for the purpose of showing the miners how to avoid the dangers encountered in their daily work. The exhibition is accompanied by a lecture in which the miners are well instructed.

* * * *

The Steel Corporation and its Employees.

Further partculars of the plans of the United States Steel Corporation for the welfare of its employees were given at the recent meeting at which it was stated that the amount paid in 1913 to and for injured workmen was £500,000. The cost of safety work in 1913 was £132,000. Serious accidents per 1,000 employees are now 38¼ per cent. less than in 1906, when this work was first taken up by the Corporation. This means that 2,273 men who might have been injured under earlier conditions were saved from serious injury during the year. In sanitation many improvements have been made in the proper investigation and observation of water supply and distribution to the men. The common or roller towel has been abolished. Washrooms, shower baths and lockers started in earlier years have been extended. During 1913, there were installed 1,193 wash basins, 210 showers, and 15,741 lockers. Two additional swimming pools for general use in the mining towns were built during the year. In regard to the pension fund, the total number of pensioners in December, 1913, was 2,082; and the total amount paid in pensions during 1913 was over £80,000.

* * * *

A Strike That Failed.

The strike, as an industrial weapon, has been badly discredited by the outcome of the Michigan copper country's lamentable disturbances. The strike has only now been officially declared "off" by the men. Estimates of the cost of this prolonged struggle are that the mine owners are out of pocket some four million dollars, the strikers a million in wages, the federation another million in strike benefits and Governments, county, state and federal, something like $700,000. The figures are probably high—so far as the mine owners are concerned, mining being a peculiar business and decreased output not necessarily representing ultimate loss as the ore unextracted remains to be marketed later. But allowing for all possible defects in the calculations the expense of this strike has been very great. It is a question whether any strike is good business policy, regarded from the point of view of the public which must bear the cost of all industrial operations in the end, and upon which the added waste of these struggles falls harshly, but in this instance very much of the loss has no excuse whatever for existence. The copper strike has been prolonged months beyond the time when it could possibly effect any result. The issues had narrowed down lately to the single dispute over recognition of the federation, and as to this everybody concerned agreed long ago that there was absolutely no chance for getting together. That the owners would not recognise the federation under any circumstances has been reported time and again by the investigators of the disturbance, and the inevitable might as well have been accepted last October as now. All the loss that has accrued in the meanwhile, whether to employers or employees, has been inexcusable. If this added waste was caused by the impossibility of bringing the dispute to a termination earlier, the fact is all the more a reflection on the value of the strike as a weapon. It is a very poor implement that is so difficult to control, and in these times of seeking after efficiency it ought to be abandoned speedily and some better substitute found for settling differences. If the prolongation of the hopeless struggle was the deliberate work of interested leaders it is highly discreditable to them, and the more convincing an argument against the character of the organisation which inaugurated this futile and costly warfare. According to the *Detroit Free Press*, Michigan's experience with the Western Federation of Miners has been anything but agreeable. Without approving all that the mine owners stand for, the people of the state will generally be pleased that the federation has lost and will trust that it has been driven out for a very long time. General sympathy will be felt for the dupes of the federation agents, the men who put their trust in it and who have been left by it to clamber out of their difficulties as best they may. The mines will take back as many of them as possible, no doubt, but there will be many sufferers.

TOPICS OF THE WEEK.

THE RAND MINES' YEAR.

The speech made by Mr. R. W. Schumacher from the Chair at the Rand Mines meeting was quite the most cheerful reading the place has had for many a long day. It confined itself strictly to the business of the company, but so wide and manifold are its interests that their progress is synonymous with the progress of the whole Rand. Despite and apart from the labour troubles the keynote of the year with the Rand Mines group was progress. This was exemplified in every department of the work of the mines, in mechanical advance, improved extraction, and the all-round intensive application of the principles of economy and efficiency. Nature and sound judgment favoured the group from the start by giving it some of the most consistently rich portions of the Rand, but the fact is not allowed to lessen the efforts of all concerned, directors, engineers and staff, in securing the maximum results. The consequence is that the group is in the van of progress in every division of mining science as applied here, and the results achieved in the past eighteen months form a striking testimonial to the inherent soundness of the whole industry to-day. The confidence and cheerful note that pervaded Mr. Schumacher's speech was wholly justified by the splendid figures he was able to produce. Better organisation underground, keener attention to the economics of rock drills and air consumption, a sustained effort to improve the efficiency of labour, white and black, and increasing study of metallurgical questions—these are outstanding features of advance on the mines of the group. That labour has to be further stimulated to realize its highest possibilities Mr. Schumacher made very clear. It is a direction in which we are on the eve of considerable progress. Without going over all the ground so succinctly covered in Mr. Schumacher's speech—which is printed in this issue—we may point to some features that reflect the excellent and improving position of the mines of the Rand Mines group. Mr. Schumacher's remarks on topics of a more general interest, such as mine hygiene, strikes, values in depth, and unification of the Rand, may be reserved for separate treatment. One fact alone illustrates the stability of these mines as nothing else can. From the details of ore reserves quoted by Mr. Schumacher, it will be seen that these reserves contain gold to the estimated value of £48,903,000, exclusive of gold to the value of £4,967,000 in safety pillars and boundary pillars, which will eventually be recovered. The only mine showing an important decrease in the ore reserves is the Village Main Reef, which is almost fully developed. The tendency at most of the big mines has been to increase their ore reserves, which were already exceptionally strong. Last year Mr. Schumacher gave full information regarding the reef values in the lowest levels of the group mines, which, on the whole, were satisfactory, and indicated that at the greatest depths of all, that is, in the City Deep and Village Deep mines, the values were excellent. The figures quoted by him at the annual meetings of the City Deep and Village Deep Companies, held early this month, which dealt with the values obtained up to the end of March, 1914, were equally favourable. Mr. Schumacher's speech contained a valuable résumé of the present position of the group. Profits for the year 1914, he showed, have been satisfactory at most of the mines of the group, the effects of the January strike being comparatively insignificant. At the Modderfontein B. Gold Mines, the results have been excellent, and bigger profits can be expected soon when the additions to the plant are completed. At the New Modderfontein G.M. Co., the profits have been very satisfactory and can, it is considered, be maintained without effort. A new mill will be built when development near the circular shaft is a little more advanced. The Rose Deep, Ltd., has shown profits a little below par this year, but the mine has large ore reserves and should pay good dividends for many years; there is also in this mine a large quantity of low-grade ore that will eventually be worked at a profit. The Geldenhuis Deep, Ltd., has been working under difficulties, the values in the lower levels of the western section being disappointing. The Nourse Mines, Ltd., has shown some improvement in profits, and is continuing its programme of development which should improve working conditions in the near future. The City Deep, Ltd., is opening up extraordinarily well, and a comparatively small addition to the labour force would enable increased tonnages to be handled at lower cost, and larger profits to be won. The Village Deep is in a strong position, and good profits will be won. The Village Main Reef G.M. Co. is continuing to show good results. At the Ferreira Deep, Ltd., developments continue good. The safety of the underground workings has been established and good profits and dividends can be expected. Mr. Schumacher stated that the Rand Mines, Ltd., had recently bought a number of shares in the Robinson G.M. Co. The mine is continuing to make good profits, and has a large reserve of cash. The Crown Mines' profits during recent months have been a little disappointing owing to a fall in the grade. This fall, which was quite expected, is regarded by the management as purely temporary. The mine is in a position to handle large tonnages, and profits will now be increased. The Bantjes Consolidated Mine is working at a small profit. The grade in the lower levels has been somewhat disappointing lately. Development work is being carried on actively. The Durban Roodepoort Deep, like the Bantjes and some others, is very dependent on a sufficiency of labour. The force has recently increased, and the profit of £6,908 was obtained in May. " My remarks," added Mr. Schumacher, " may be summarised as follows: The results obtained in 1913 were abnormally low owing to labour troubles, which also slightly influenced the results of the earlier months of 1914. Recent profits of our mines have been satisfactory, with the exception of those of the Crown Mines, which suffered a temporary set-back, from which the mine is already recovering. The indications are that many of the mines will show better profits for the second half of 1914 than for the first half. The ore reserves of our companies are exceptionally strong, and reef values encountered at the greatest depth, that is in the City Deep and Village Deep mines, are most encouraging. While there has been marked impoverishment in depth in certain portions of the Witwatersrand, there has been little or none in other areas, and our mines have for the most part not been adversely affected. Many of our important mines have not yet reached their zenith, and will soon grow stronger. There has in recent months been an improvement in the native labour force, and there is an increasing tendency on the mines to make better use of the labour that is available. Considerable reductions have been effected in working costs, and it remains for us to obtain better efficiency from the human unit. We are continuing to make every effort to improve health conditions on the mines. The general outlook is hopeful, and there should be a tendency for gradual all-round improvement in mining results." In the course of his speech, Mr. Schumacher paid a notable and well deserved tribute to Mr. Samuel Evans for his work in the cause of mine hygiene, and concluded with generous acknowledgement of the services of the engineering and administrative staff in a particularly trying year: which Mr. Schumacher's reassuring speech should go far to make the community forget.

RAND VALUES IN DEPTH.

It may be remembered that when Mr. H. H. Webb's rather depressing conclusions on Rand values in depth were published last year we pointed out that they should be accepted with certain reservations and qualifications. Important testimony in support of that conclusion was forthcoming at the Rand Mines meeting on Wednesday, both the Chairman, Mr. Schumacher, and a director, Mr. E. J. Renaud, who is also an experienced mining engineer, dealing with the matter. Mr. Schumacher showed that the reef values in the City Deep and Village Deep continue very good in spite of the great depths attained. Good values, he said, have also been found in other mines of the Witwatersrand at a vertical depth of about 4,000 feet or more. The Cinderella Deep and Brakpan Mines are well-known instances. Mr. Schumacher added: "I am informed that the lowest workings in the East Rand Proprietary Mines, which are on the 30th level from the Hercules shaft, at a vertical depth of 4,361 feet, have so far disclosed reef values averaging 17 dwts. over 26 inches for a distance of 102 feet sampled. It was stated in an important report issued towards the close of last year in connection with certain mines on the Witwatersrand that:—' There can be no doubt that there is a gradual falling-off in the average values over large areas of the ore developed as deeper sections of the Rand are opened up.' " Mr. Schumacher proceeded to show that this statement was true, but only in a limited degree. It does not apply to the whole of the Witwatersrand, where in many large areas little or no impoverishment has so far taken place. This is confirmed by the developments in the majority of the mines of the group, which extend from the Durban Deep on the west to the Modderfontein District on the east. On the far Eastern Rand, where the reef dips at a comparatively flat angle, they are developing at the New Modderfontein ore of high grade at the circular shaft, where the reef is 6,500 feet from the outcrop, and, as is well known, ore of excellent grade has been encountered still further to the south in the Modderfontein Deep Levels and in the Government Gold Mining Areas (Modderfontein) Consolidated; also in the Brakpan Mines, where the remotest workings are situated approximately 20,000 feet from the outcrop measured on the dip of the reef. " The point that I wish to make clear," said Mr. Schumacher, " is that whereas the ore becomes poor in certain areas of the Witwatersrand as depth is attained, there are yet no indications of a similar occurrence in other extensive localities, and fortunately the majority of our mines are situated in districts where no appreciable impoverishment has taken place in depth during recent years." In seconding the adoption of the report, Mr. Renaud strongly supported the Chairman in regard to the vexed question of the decrease in the grade of the ore of the mines of the Rand with depth. " Our critics," he said, " whose thoughts are guided by their wishes, should take the trouble of perusing the assay records of the various mines and tabulate the values obtained not in specially selected areas, but as a whole. They should also refrain from taking as a basis of their comparison the values obtained in the upper workings, where oxidisation and concentration have of necessity taken place to a certain extent; neither should they lose sight of the fact that the gradual reduction in working costs which takes place from time to time enables the treatment of blocks of ore, previously considered unpayable, thus bringing about an apparent reduction in the grade of the ore milled; I would, therefore, advise them to base their conclusions on the whole of the assay values obtained in each mine and each level irrespective of payability or unpayability. Having once determined whether or not the general average of the values of the ore has decreased in depth they could then draw comparisons between the proportion of payability of the various levels. These comparisons would have to be based on the economic conditions governing working costs at the time of the working of the respective levels. The above would, to my mind, be the only fair means of arriving at a convincing conclusion on the question of the stability of the decrease of ore values in depth, and consequently on the probable life of the Rand." Mr. Renaud's views carry great weight, and it will be interesting to see how the critics answer him. For ourselves, we are content to regard the question as still an open one. As we pointed out, when last discussing the matter, despite the recent noteworthy strengthening of the ranks of the pessimists, we must confess that we cannot see that the theory of the " blotting pad " distribution of the gold in the Rand banket has been sensibly weakened by developments of the past few years. On the contrary, the exploitation of deep levels on a very large scale during the past half a decade seems to have strengthened the evidence in favour of the acceptance of this thesis which presumes that the auriferous content of the conglomerate may be resembled in its distribution to the sporadic blotches which figure on a piece of blotting paper if one shakes a full fountain pen over the blotting pad. The idea appears admirably to portray the irregularity of the rich and poor zones and the impossibility of applying any mathematical calculations as to the probable impoverishment or enrichment of certain zones. The blotches of ink may be taken to represent the high grade zones and the white of the blotting paper the low grade rock, and although the gradation between rich and poor zones is actually more pronounced than is depicted by the ink spots on the paper the theory appears to us to be far more acceptable when considered in the light of figures as to actual development than the thesis that the gold has an increasing paucity of concentration as greater depths are attained.

ACTIVITY IN THE PILGRIMS REST AREA.

Formosa Company Erecting Plant—Small Workers Producing £115,000 per Annum.

A GREAT deal of activity still appears to be taken in the Lydenburg—Pilgrims Rest mining area, and a large number of small ventures are reported to be opening up in a very satisfactory manner. Much interest is being taken in the Mount Anderson district, where the Formosa Company is erecting a two-stamp battery and arranging for the installation of new sluice boxes. This concern, it will be recalled, was recently floated in Johannesburg and some exceedingly rich specimens of gold from the property were exhibited locally. The work of despatching any plant to the property has been attended with great difficulties on account of the exceedingly rugged and bad nature of the road from Lydenburg. However, the work is now proceeding satisfactorily, and the Formosa management anticipate announcing production results at an early date. In the past we have often written that the Lydenburg—Pilgrims Rest gold fields, were they situated in any other country than the Transvaal, where the predominance of the Rand tends to throw all other auriferous areas out of their true industrial perspectives, would engage very much more attention than they do. This district is at present producing gold at the rate of over £600,000 per annum. Such well-known mines as the Transvaal Gold Mining Estates, Glynn's Lydenburg, and the Ceylon Lydenburg are well known to the outside public, but on the other hand very little notice appears to be taken of the "small mine" possibilities of this area, which, were it situated in Southern Rhodesia, would soon take rank with Hartley or Gwanda or any of the other prosperous "miniature mine" regions of Matabeleland and Mashonaland.

SOME OFFICIAL FIGURES.

A few figures regarding the present achievements of some of these smaller properties should here prove of interest. According to the statistics issued by the Union Department of Mines, there were during the month of April no less than 18 producing mines in the Pilgrims Rest area. The 18 mines declaring gold employed 163 stamps and 5 tube mills, and crushed 26,522 tons of ore. The total output declared was 12,502 fine ozs., or in value £53,105. For the same period the output analysis sheet issued by the Chamber of Mines gives particulars of three mines operating in this district—the Ceylon Lydenburg, Glynn's Lydenburg, and Transvaal Gold Mining Estates. These properties had 100 stamps and 4 tube mills at work, and they produced gold having a total value of £45,617. In other words, in addition to the larger and more important ventures which regularly declare outputs to the Chamber of Mines, there were 15 concerns milling ore in the Pilgrims Rest area during April. These 15, in addition to the Ceylon Lydenburg, Glynn's Lydenburg, and Transvaal Gold Mining Estates, declared outputs. They employed 63 stamps and 1 tube mill and declared an output of £7,488. In addition there have to be taken into consideration the following

		Output.	
		Ozs.	Value.
Reef Diggers declaring gold	5	277	£1 177
Alluvial Diggers . .	5	227	966
Tailings Works	1	5	23
	11	509	£2,166

Adding this to the figure of £7,488 already arrived at, the grand total of production amongst the small workers of the Pilgrims Rest area is £9,654 in the month, or at the rate of over £115,000 per annum.

CHARACTERISTICS OF THE FIELD.

As to the district generally, old pioneers will recall the fact that some of the early gold discoveries in the Transvaal which caused considerable excitement were in the Lydenburg district. Here and there phenomenally rich discoveries were made in the neighbourhood of Pilgrims Rest (approximately 22 miles north-east of the township of Lydenburg). A good deal of interest was taken in the new field in the early eighties—that is, before the Rand discoveries engrossed attention—for there had been in this Lydenburg district sporadic rich finds of gold, and various companies were formed then and subsequently to exploit the field lying to the north-east, east, and south-east of the town of Lydenburg. The country is of very rugged character, the peculiar geological formation leaving numerous hills, varying as to strata, in consequence of denudation of countless ages. Generally the hills are topped with shale, in some instances with dolomite. The stratum nearest to surface is Lydenburg shale, of considerable thickness, unless there has been extreme denudation, washing it away from the top of the hills. The shale sometimes carries quartz formation termed Bevett's reef. Below the shale there comes a band of chert, at the footwall of which occurs what is termed the Theta reef, such term evidently being derived from the Main Reef body worked in a section of the Transvaal Gold Mining Estates area. There next comes a considerable thickness of what is termed upper dolomite, parted from a lower, thick dolomite deposit by a sandstone bed. In the lower, thick dolomite deposit occurs what is termed the Glynn's reef—here again the name derived from the reef deposit worked on the Glynn's Lydenburg, Ltd., property. Under the lower dolomite there is a heavy deposit of sandstone, and below the sandstone is the granite bedrock. The reef formation in this district is of quartz. It is of somewhat bunchy character, thin in one place, bulging out in another, and lies almost horizontally. Sometimes there is a slight tilt at an angle of about 4 to 7 degrees, but this to all intents and purposes is to the lay mind quite flat. Generally mining is effected by driving adits into the sides of the numerous and large hills. In consequence of this economic style of working, the expenses in the Lydenburg district are less than the average of companies extracting banket ore by means of shafts and levels at different depths. The reef formation is much more easily mined and treated than is banket, the reef matter being readily crushed. Then, too, as the Lydenburg district contains numerous streams with a fair amount of fall, water power is often obtainable wherewith to generate electrical energy. Altogether there can be but little doubt that the Lydenburg—Pilgrims Rest field offers attractions to the small worker at least as promising as in several of the better known miniature mine regions of Rhodesia.

The Sheba.

The following are the results of the operations of this mine for the month of May, 1914:—Crushed, 7,010 tons, yielding 3,296 ozs; estimated profit, £1,035.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of May, 1914:—Central Mines: Tons crushed, 13,000, yielding 7,805·393 fine ozs. Elandsdrift Mine: Tons crushed, 700, yielding 768·500 fine ozs. Vaalhoek Mine: Tons crushed, 1,550, yielding 615·341 fine ozs. Estimated value of output, £38,923; estimated profit for month, £22,040.

Piggs Peak.

The following is the result of this company's operations for the month ended 31st May, 1914:—25 stamps ran 28·2 days crushing 3,105 tons, yielding 445 ozs. fine gold; cyanided 3,103 tons, yielding 537 ozs. fine gold; concentrates shipped, 2 tons, containing 31 ozs. fine gold; total recovery, 1,013 ozs. fine gold; estimate value, £4,297 8s. 9d.; working costs, £2,862 15s. 1d.; working profits, £1,434 13s. 1d.; credit adjustments on previous estimates of gold and concentrates, £33 9s. 5d.; total profit, £1,468 2s. 6d.

GOLD DREDGING IN SOUTHERN AFRICA.

Operations of the Andrade Mines—Activity in the Northern Transvaal Foreshadowed.

So far alluvial gold propositions in South Africa have not proved much of a success. It is difficult to assign any close reasons for this. Whether it be due to poverty of the gravel or the application of unsound methods of extraction or to transport difficulties it is hard to say. The success recently achieved by the Andrade Mines in Portuguese East Africa in connection with dredging induces one to give the matter of dredging in some of the outlying auriferous areas of the country more attention than has so far been bestowed on it, and in this connection it is of interest to learn that there is likely to be exhibited some measure of activity in the Northern Transvaal in the near future.

Operations in Portuguese Territory.

For the accompanying photograph and following notes on dredging operations in Portuguese East Africa, we are indebted to Mr. C. H. Page, who has recently returned from that country. Mr. Page writes:—"The accompanying photograph shows the dredge at work on the alluvial deposits of the Andrade Mines, Ltd., working with great success a few miles from Macequece in Portuguese East Africa. The company, which commenced work about 12 months ago, has been producing largely lately and recently recovered about 4,000 ozs. in one [illegible]. The dredge, which the Americans built, is about 110 feet long and capable of handling from 12,000 to [illegible] yards (cubic) of wash each day. There seems little doubt that there are great possibilities for this and similar concerns, as although the ancients worked out enormous areas there still remains much for the present generation. The cost per load is small and the yield very large as compared to alluvial fields in other countries. The dredge is worked by electric power, which is generated at the falls 15 miles away. Another dredge is on order, and the output of this company should therefore be considerably increased shortly, all the known promising alluvial ground having been taken up in the territory, the inhabitants of which certainly have to thank Mr. [illegible], the general manager of the company, who, by his perseverance and energy, has brought the company to the present prosperous condition. It seems strange that no work of a similar nature has ever yet been seriously undertaken in the Transvaal. The writer of this, who has recently returned from Portuguese East Africa, has just secured for Californian experts large holdings on the Selati and Thabina Rivers, in the Northern Transvaal, which he considers suitable for dredging, therefore it is quite possible we shall shortly see some activity in that district."

The Dredge of the Andrade Mines, Portuguese East Africa.

The Promise of the Northern Transvaal.

As to dredging prospects along the Selati River, it should here be of some interest to refer to the views of a gentleman of eight years' experience in sluicing and dredging, who inspected and reported on a property in this district some little time ago. In the course of his report, the gentleman in question stated:—"Throughout the whole length of the ground a large body of alluvial wash is exposed for a width of from 300 to 500 feet, and has a depth of approximately 24 feet; that is, equal to 2,700,000 cubic yards. It consists of alternate layers from surface to bedrock of (1) coarse gravel; (2) fine and coarse gravel and sand mixed with water-worn stones varying in size from 3 in. to 9 in. diameter. Gold is found in both and is evenly distributed. A number of cuts have been put down and shallow paddocks opened up at intervals throughout the entire length of the property, and have in every case yielded exceedingly satisfactory results. From a large number of loads washed, it was found that the river wash yields from 10 grains to 3 dwts. of gold per cubic yard excluding the gold from the wash lying on the bed rock, which is estimated to yield from 3 to 8 dwts. of gold per cubic yard, but which I was unable to reach with the primitive appliances at my disposal, on account of water. The bedrock is for the most part red granite, but there are also bodies of soft schist, slate, and several dykes of very soft diorite running transversely to the course of the river wash. The source of gold is probably numerous reefs and leaders which are a characteristic feature of this part of the country, and incidentally it may be mentioned that some of these reefs, situate higher up the river, are being worked with satisfactory results. In addition to the wash on the river, there are about 7,000,000 cubic yards of wash on the terrace south of the river, all of which could be profitably worked; a large proportion of this is exposed, the remainder serving an overburden of varying thickness. The gold in the wash on the terrace cannot be estimated so closely as that in the river, as it has not been so thoroughly tested, but very good prospects were obtained from a shaft forty feet in depth, also from an open cut on the terrace. In another place 1,500 feet south of the river, very good prospects were obtained from a shaft forty feet in depth, also from an open cut on the terrace. In another place 1,500 feet south of the river, very good prospects were also obtained from the surface. There are no obstacles which would interfere with sluicing or dredging operations, as throughout there are not any loose boulders discernible, and it is reasonable to assume that there are none under the wash, particularly as the surrounding country is very flat for some miles back, the nearest kopje being six miles distant. There appear to be no logs, and there is no fibrous matter nor clay to contend with. A few patches of shrubs and reeds are to be found here and there, but these could be removed at trivial expense."

In view of the facts that the Andrade Mines Company has made a success of its dredging operations in Portuguese East Africa, and that it is reported that Californian alluvial workers are acquiring interests in the Northern Transvaal, it is possible that in the near future this branch of mining, which has so far been largely neglected in South Africa, will have more attention accorded it.

Roberts Victor Diamonds.

The following are the results of operations of this Company for the months of May, 1914:—Loads washed, 17,797, and [illegible] yielded 1,003¾ carats.

THE MANAGER AND STAFF OF THE NIGEL G.M. CO., LTD.

Left to Right.—Top row: W. F. Bulger shift boss; J. Diamond, junior clerk; F. May, electrician; S. Coleman, foreman blacksmith; A. F. Pithey, compound manager; C. Mellow, foreman fitter; H. Parfitt, native timekeeper.
Second row: J. B. Dicks, assistant sampler; H. R. Corin, chief sampler; J. Farren, shift boss; D. J. J. de Villiers, shift boss; R. E. Rule, shift boss; E. P. Cleaver, assistant secretary; A. J. S. Brown, storekeeper.
Third row: J. D. O'Hara, reduction manager; E. J. Matthews, mine captain; W. E. Lamb, mine secretary; Leo E. de Villiers, manager; W. H. Bodilly, engineer; C. L. Lamb, surveyor; A. A. Topp, foreman carpenter.
On ground: F. Codling, assistant native timekeeper; H. Clark, assistant storekeeper.

Photo by Ollicer.

Wolhuter Gold Mines.

Report for the quarter ended 30th April, 1914, is as follows:—Total working costs, £81,401 2s; 3d., per ton, 16s. 10.45d. Profit for quarter, £39,248 9s. 2d.; per ton, 8s. 1.61d. Revenue, £120,649 11s. 5d.; per ton, 25s. 0.6d. Note.—No allowance has been made in the above statement for the Government tax on profits. Dividend.—On the 15th April, 1914, dividend No. 13 of 6¼ per cent. (1s. 3d. per share) was declared for the six months ending 30th April, 1914, payable to shareholders registered on 30th April, 1914. Capital expenditure for quarter.—The capital expenditure was as follows:—Shafts, £2,620 7s.; buildings, machinery and plant, etc., £896 17s. 8d. Total, £3,517 4s. 8d. Approximate tonnage sent to crusher house, 106,046 tons; waste sorted out (8.483 per cent.), 8,996 tons—97,050 tons; in mill ore bins, 1st February, 1914, 250 tons—97,300 tons; tons milled, 96,500 tons; in mill ore bins, 1st May, 1914, 800 tons. Milling.—Number of stamps running, 120; total time run, 84.157 days; tons milled, 96,500 tons; duty per stamp per day, 9.556 tons; assay value of ore milled, 6.237 dwts; yield in fine gold, 21,171.606 ozs.; yield per ton milled, in fine gold, 4.389 dwts. Cyaniding.—Tonnage treated, 96,500 tons; yield in fine gold, 7,552.334 ozs.; yield per ton milled in fine gold, 1.565 dwts. Recovered from all sources—28,726.940 ozs = 5.954 dwts. fine gold per ton milled. Development.—Footage developed: East shaft, 2,577 feet; west shaft, 1,292 feet; Mynpacht, 128 feet. Total, 3,997 feet. Shaft sinking (west shaft), 12 feet; total depth of shaft, 3,717 feet. Shaft sinking (east shaft auxiliary), 10 feet; total depth of shaft, 169 feet. Footage sampled.—East shaft: Footage sampled, 2,369 feet; average reef width, 29.1 ins.; average reef value, 8.3 dwts.; average stope width, 51.1 ins.; average stope value, 4.7 dwts. West shaft: Footage sampled, 1,171 feet; average reef width, 31.9 ins.; average reef value, 13.8 dwts.; average stope width, [illegible] ins.; average stope value, 7.9 dwts. Mynpacht: Footage sampled, 91 feet; average reef width, 10.5 ins.; average reef value, 2.9 dwts.; average stope width, 53.9 ins.; average stope value, 2.2 dwts. Totals.—Footage sampled, 3,631 feet; average reef width, 30.3 ins.; average reef value, 10.0 dwts.; average stope width, 52.8 ins.; average stope value, 5.7 dwts. Tons developed or exposed during the quarter (includes ore mined from development).—Estimated payable tonnage—East shaft, 45,727 tons, assay value 5.47 dwts., over 55.3 ins.; west shaft, 43,932 tons, assay value 8.06 dwts., over 65.0 ins.; Mynpacht, 5,742 tons, assay value 4.48 dwts., over 17.2 ins. Total, 95,401 tons, assay value 6.61 dwts. over 57.7 ins. Estimated unpayable tonnage—East shaft, 16,565 tons, assay value 3.10 dwts., over 55.1 ins. Ore reserves.—The payable ore reserves at date are: 756,488 tons, valued at 6.14 dwts., over 52.1 ins. General.—The machinery and plant continue in good working order.

Dr. Watkins-Pitchford, director of the new South African Institute for Medical Research, which is fast approaching completion, left for Europe last week, in order to undertake a mission on behalf of the institute. Dr. Watkins-Pitchford will be absent for about six months, and during his absence he hopes to interview the directors of the leading research laboratories of the world to note the various lines of work and different methods of organisation obtaining. He will also take advantage of his visit to discuss with other authorities the possibility of co-operation between South African and other institutes in the investigation of the various problems connected with medical research. He intends to visit the leading laboratories in England, United States, and the Continent of Europe; and will also probably extend his visit to Algiers, Cairo, and Khartoum.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of May, 1914.—Tons crushed, 3,998, yielding 2,100 fine ozs.; estimated value of month's output, £8,789; estimated profit for month, £1,461

THE TRUE FUNCTIONS OF THE "CAPITAL ACCOUNT."

Unsound Accountancy Policy Pursued by Some Rand Companies—Some Authoritative Recommendations.

WHAT items of the expenditure of a productive mining company should be charged to capital account, and what should not? This subject has been frequently discussed amongst shareholders, directors, engineers, and before numerous accountancy and technical associations. No finality has yet been reached in the matter, and it is doubtful if any finality will be reached, but at the same time it is the opinion of many critics and shareholders that it is high time the capital expenditure accounts of a large number of mining companies should be closed once and for all, unless, of course, large additions to equipment or the opening up of new properties are undertaken.

THE I.M.M.'S RECOMMENDATIONS.

So important is this matter that some little while ago the Institution of Mining and Metallurgy appointed a sub-committee specially to enquire into mine accounts. The findings of that committee, particularly in regard to differentiating between capital and current working accounts, are of particular interest and value. Briefly stated, the finding of this committee was that before the producing stage is reached, all expenditure should be charged to capital account and may be grouped under the following heads:—(1) Property; (2) Main Shafts or Main Adits; (3) Machinery and Plant; (4) Buildings; (5) Surface Works (Reservoirs, Water Service, Railway Sidings, Roads, etc.); (6) Underground Development. Main shafts or adits to reach ore bodies should be charged direct to capital. Incline shafts which develop ore, subsidiary shafts, winzes, or other workings which have assisted development of ore during progress, should be charged to "Underground Development," which either may be subsequently treated as a Temporary "Development" Account, or may remain a capital charge. All other expenditure should be carried to a "General Expenditure Account," to be distributed proportionately, as soon as possible after the mine enters the producing stage, over the remaining heads of expenditure, after deducting any revenue which may have been received. After the producing stage is reached, no expenditure should be charged to capital account, except large special items, such as (1) purchase of additional property, (2) sinking of new main shafts to reach ore bodies; (3) erection of additional buildings, machinery, plant, or surface works which may be necessary either to increase output, to improve recovery, or to decrease costs. Such items of capital expenditure should bear their proportion of the administration and general charges. If any existing shafts, machinery, plant or buildings should be entirely superseded and replaced, the cost of the old items should be written off capital to profit and loss, either at once (if small) or in the case of large items by instalments spread over as short a period as the responsible engineer may recommend. All repairs, maintenance and replacements of minor machinery and plant should be charged to working costs. Included in the report of the committee appeared the following:—"In the interest of shareholders, the committee desire to express their strong disapproval of the practice which is sometimes resorted to, of charging to capital items of expenditure that should properly be included in working costs, thus exhibiting a fictitious statement of profit."

SHAFT SINKING.

The Committee considered that all vertical (main level) shafts and inclines sunk to reach the [illegible] of the ore bodies should be charged to capital account. All incline shafts in ore and shafts which assist development as they progress should be considered as part of the expense of development, the latter being either (a) placed to Temporary development account, or (b) charged to capital account finally. Theoretically, the cost of vertical shafts should be written off under the heading of depreciation, a proportion for each year over an estimated life, but in practice this is seldom found to be desirable. After the producing stage is reached, all expenses of development, including deepening main shafts, sinking incline shafts, cutting stations, drives, crosscuts (including main crosscuts), winzes, rises, etc., should be charged: (a) direct to the working costs; or (b) to the development redemption account. In the latter case, working costs should be regularly debited with a rate of development redemption per ton milled, slightly in excess of the average cost at which the total, fully-developed and payable ore reserves stand in the books—the object being to extinguish gradually the temporary account, and thereafter to charge all current development and shaft sinking to working costs, or to provide funds for securing a gradual and automatic increase in the ore reserves. The quantity of ore developed cannot, it is true, be well ascertained at short intervals, but it can be determined annually more or less closely, and a fair rate can be fixed as the price per ton under (b). After the producing is reached, no expenditure should be debited to capital account, except for large special items, such as:—Purchase of additional property; increase of machinery or plant, to increase power, output or extraction; erection of additional buildings, dams, etc.; sinking of new main shafts to reach ore bodies; excess development of payable ore that can be clearly proved to be excess development, guarding carefully against abuse. Such items of capital expenditure should bear their proportion of the administration and general expenses. No small items, repairs, maintenance, or merely replacement of worn out machinery, should be charged to capital account, which should be considered as closed, except for heavy expenditure specially authorised when funds are specially raised, or allocated for the purpose. Each additional large installation should be shown separately in the balance sheet, if possible. In cases where a new deep shaft, with its equipments, takes the place of an old shallow shaft, or an idle mill is replaced by a new one, the old shaft or the old plant should be written off from capital account against revenue, either at once or by means of instalments spread over a short period. Alternatively, if no depreciation is written off, the cost of the new plant should be charged direct to revenue, by instalments if necessary.

REFORM NEEDED ON THE RAND.

It is unfortunately true that the practice of showing phantom profits in quarterly reports and only at the end of the year disillusioning the shareholder by exhibiting the true financial state of affairs and showing the large deductions that have to be made on account of various liabilities is not uncommon amongst some Rand companies, and in these liabilities items which should have been included in working costs but which have been grouped at the end of the year under capital expenditure are often responsible for the largest deductions from apparent profits. One important Rand mining venture in the quarter ended with March last charged to capital account the huge sum of over £66,000 in respect of operations for the three months in question. The mines comprised in this concern have been productive for a very considerable period in some instances for well over ten years, whilst the parental organisation was floated a quarter of a century ago and it was understood that all large construction work ceased years ago. Yet we find this concern still maintaining a capital account at the rate of about a quarter of a million per annum! Shareholders, generally speaking, object to the maintenance of large capital accounts unless the retention of them is absolutely necessary. When the working profit is stated to be so much, the average holder of scrip figures out what dividend his money is likely to yield him, and it is, to say the least of it, disappointing to find that the actual earnings even after all largely mirage profits—that they have been swallowed up in Government profits tax, debenture interest, capital expenditure, etc. The company referred to above is by no means a solitary example.

In fact, there are numbers of Main Reef mining ventures which quarterly and annually record large amounts incurred on capital account for which on the definitions and recommendations of the I.M.M. Standarization Committee there is no justification. On the other hand, it is readily admitted that some mines tabulate their financial positions and show shareholders just what amounts are likely to accrue to the Government in respect of profits tax and what sums have been expended on reasonable capital expenditure in an admirably clear and lucid matter. What is wanted, however, is the falling into line of all Rand companies in so far as is possible along the excellent path to clarity, which the mines above referred to are following.

The Functions of Mine Accounts.

It must be recollected, too, that mine accounts have to fill several different primary functions, and are not merely confined to one object; for instance, whilst serving as records for guidance in the distribution of expenditure and the collection of revenue, they must also show the profit and loss, or the financial condition of the undertaking; but this does not exhaust their aims, as they should be properly designed to supply the management with the statistical data necessary to check the efficiency of the administration, and to point out the direction in which useless expenses may be cut down, or revenue may be increased. It is perhaps too much to hope that complete uniformity in methods of accountancy will be established as between all Rand mining concerns. But nevertheless it may be reasonably hoped that the excellent lucidity to be found in the reports of some mines, particularly in regard to expenditure included under the heading of capital account will in time be extended to numerous other concerns as well.

THE MINING POSITION IN MADAGASCAR.

A Brief Account of Recent Progress and the Situation in the Island.

A Madagascar correspondent writes:—"It is now some time since I gave you any news of this island. I do so now because I think it will interest a good number of your readers, who, I notice, are again beginning to invest capital here. There is no doubt at all that there is here in Madagascar a large and fruitful field for capital, but I would point out to investors that capital is not all that is required; it is no doubt the first necessity, but good management is also needed, and to have good management you have got to have good practical men. Now some of the companies I could mention seem to have forgotten that fact, and work done here has cost enormously more than it should have done: this is not the fault of the country or the Administration of the country—the fault lies entirely with the management of the companies. Shareholders should see that the right class of man is employed. The great mistake the French Administration has made is allowing a few individuals to lock up huge tracts of country, without even adequate compensation. Take, for instance, oil claims. One claim held under prospecting permit is of six thousand acres in extent, and this costs £1 per year. There is no limit to the number of claims a man may hold, so that it is possible to lock up a million acres for the small sum of £170 per year, and although the Administration has the right to refuse renewal they have not done so, and ground has now been held for six years. A new mining law is, however, being framed which will modify conditions, though still leaving individuals the right to acquire large tracts. The cost, however, will be heavier and the title will hold good for three years certain. After expiration the owner must change his title to one of exploitation and pay heavier taxes, so that he will be obliged to either work or abandon the ground, or contribute heavily to the treasury of the country. It never pays any country to allow its lands to be locked up by the concession hunter, and the Britishers in Madagascar are urging the Government to stop it, though the new mining law will be probably the most liberal in the world. For the last two years prospectors have neglected gold and have given all their attention to graphite, but there seems to be danger of over-production. I should say that Madagascar has enough graphite deposits to furnish the world's demands for many years to come; vast deposits, some of them 150 feet wide and traceable for several kilometres, are being opened up, many of them giving 20 per cent. of graphite going as high as 96 per cent. in carbon, and flake from 20 mesh to 50; lower than 50 it is not profitable to work, as prices are too low, but it is quite likely that in the near future the flaked graphite of Madagascar will knock out of the market the amorphous graphites of other kinds. I have always said that there exists in Madagascar a large field for gold dredging. It has never yet had a fair trial. There are now, however, serious efforts being made to test the extent and values of some of the deep rivers, and in a few months I hope to be in a position to give you the results of the tests. Several miners from Africa are here hydraulic sluicing, and for this class of mining there is also a fair field. The natives in Madagascar do not understand it, nor do the French, so that good practical men stand a fair chance of success. I would point out, however, that it is useless for men to come here looking for work: there is none to be had; and anyone coming here on his own behalf should have ample capital."

Another View.

Another correspondent writes:—"In my previous letter to your esteemed paper, I gave a few examples of the anomalies which have contributed to alienate the investing public in general from any scheme connected with Madagascar. I shall continue now my criticism, which is not meant in any way to cast a reflection on the Administration, but simply as general suggestion as to what settlers in the island, like myself, would consider most beneficial to the rapid development of the enormous resources of the Colony. Each province of the island is in charge of an Administrator, Chief of the Province, an official to whom should be given the full opportunity to make himself acquainted with the requirements of the territory under his care; some of the provinces have areas exceeding that of Natal and Zululand together, and with the primitive, and, therefore, slow means of communications, it would take a considerable time for anyone intending to visit them and make himself acquainted with the needs of the various districts of the province under his jurisdiction; now, very often it happens, that after a few months, the Administrator is removed to another province where his stay might be just as short as the previous one. For the settler, who has, perhaps, had opportunities to meet the Chief of the Province, or who undertook a long and expensive journey on purpose to confer with him, and has, perhaps, succeeded in enlisting his sympathy when exposing his case, the removal of that important official at that juncture is of course a serious matter. The same policy of transferring minor officials is, I consider, also highly detrimental to the welfare of the community, and the day that a full term of two or three years is made as the shortest stay of the officials in a district, we will go to our business with a much greater confidence, knowing that those who represent the administration understand the needs of those who have to apply to them for advice and assistance. I consider that the powers of the Chiefs of Provinces should be extended, that it should not be always required, in every instance, to refer matters to headquarters, as, owing to the poor communications, months and months elapse before a reply is received, and in the meantime, perhaps a season is lost, expenses are incurred, and a lot of inconvenience caused.

and it is not right that, owing to officials being afraid of exceeding their responsibilities, the settlers should be made to suffer. As in all small settlements, all over the world, in the outside districts, the official in charge has a certain authority, and his status is in his mind very high indeed—well, let it be so, perhaps, and I have found it often, he is a good man and does his best, as long as he thinks that he does not commit himself. I have mentioned already about the application of the home customs tariff to the Colony, which is a mistake, and I maintain that if the true interests of the Colony have to be safeguarded; to impede the introduction of articles of foreign origin by the levying of the same high protective duties as imposed at home, in order to favour home manufacturers, is out of the question. The natural source of supply for Madagascar is undoubtedly South Africa; from South Africa the great island could draw whatever she requires, cheaper than she gets from France and not depend on the mother country for many an article which the mother country has herself to import. Machinery of all kinds imported via South Africa, should be admitted into the island at a special preferential rate, when of foreign origin; the advantage of having such an important market like South Africa within easy reach should certainly be taken into consideration and in order to facilitate transactions between the two countries, special advantages should be afforded to settlers drawing their supplies from South Africa. Instead, everything coming from South Africa is taxed to its utmost, and even French goods coming via South Africa and having been landed for transhipment in South Africa, loose their right to enter the island duty free, but pay the highest duty. It would be a very good policy on the part of the Governor-General of Madagascar if a certain sum were set aside in the next Budget, to send a deputation of settlers to South Africa to study local conditions, to learn from us what it has cost us, and how we succeeded in building a progressing country under conditions once so very similar to those which are prevailing now in Madagascar, and to save time, by taking advantage of what has been done in the various branches of farming, and by adopting such methods as would, by profiting the individual settlers, contribute to the prosperity of a country whose resources might prove in time a precious asset to the mother country. The sooner this course is followed, the sooner we are better known, I have no doubt it will be possible to clear all misunderstandings; South Africans would be encouraged to visit the island, and, no doubt, many would go there and try their luck, either in farming or in mining ventures, and the influx of capital and settlers from South Africa would cement friendly relations between the two countries, which, as I said before, are so near and yet so far. I purpose in my next letters to give a concise survey of the various laws of the country, its agricultural resources, its industrial and mining possibilities and some advice to intending settlers; trusting that the French Consular authorities in South Africa will lend their assistance to my modest endeavour to better the relations between the two countries."

TIN DEPOSITS NEAR CAPETOWN.*

The geological structure of the Cape Peninsula and its neighbourhood shows basement granite capped by the slates and quartzites of the Malmesbury series, again overlaid by the Table Mountain sandstones. Cassiterite has been found occurring in veins and associated impregnations in granite and also in the rocks of the Malmesbury series and in detrital deposits resulting from denudation of these rocks. Examples of the first are found about 18 miles east of Capetown on the properties of the Kuils River and Cape Bischoff tin companies; they are found on the upper slopes of a low range of granite hills and tin occurrences have been traced for about a mile. The granite is a coarsely porphyritic variety with biotite mica. The veins are connected with a fine-grained [illegible] dike rock composed of quartz, albite and muscovite. The veins are of compact white quartz with muscovite concentrated on their selvages. The cassiterite occurs as crystalline masses and crystals, and is associated with wolframite, molybdenite, chalcopyrite and arsenopyrite.

Fine tin ore occurs impregnating the granite along shear zones. The veins run north-west and dip 80 deg. to the east. Though they carry rich tin ore in places, they did not appear to me to hold much promise of successful mining. Their denudation has, however, formed some rich alluvial deposits in a valley about one mile long. The Kuils River Company owns the upper portion of the valley which is laid out in vineyards and orchards. The company worked some of the shallower ground by primitive hand sluicing, wheeling the deposits to long boxes for washing. This method proved most expensive and little profit was made. Later on, the company was reorganised by an English syndicate acquainted with Australian methods and a semi-portable barge equipped with a 10-in. centrifugal pump was installed.

There is a scarcity of water, necessitating great care in its use; there is no drainage for the tailings except in worked-out ground; the ground [illegible]. These three considerations govern the method of working employed. There is from 20 to 30 ft. of sandy overburden above the old stream bed. Hydraulic sluicing through a 2-in. nozzle is carried on under natural head from two storage dams higher up the valley and the large boulders are stacked by hand labour. The tin ore and sand are sluiced into the sump or dredge and elevated to the sluice boxes. At the head of these is a grizzly with bars about 1 in. apart; [illegible]

At the end of the sluice there are two spitzkasten. [illegible] moved higher up the valley when necessary, but it will be seen that by lengthening the suction pipe and carrying it up stream, the suction head will be reduced and a new sump can be blasted out, so that the old channel can be filled past where the dredge is now situated without stopping the work. Of course, much tin ore remains in the ground sluices to the sump, and is sent to the sluice boxes only during cleaning up, when the rush of water is less.

The method of conserving water is of interest. The overflow from the last spitzkasten is pumped up to the storage dams and reused for sluicing. Both the slimes and to a certain extent the sands drain back into the sump. It seems a pity at first sight to see the beautiful vineyards, orchards and plantations being eaten up, but it is easy to imagine that with this system of working in a few years the damage will be largely repaired.

The lower portion of the valley is under different ownership and this deposit will be sluiced direct to some barren, sandy, lower lying land, which will be resoiled in a somewhat similar manner.

The lode tin deposits in the Malmesbury beds are being explored on the Devils Peak of Table Mountain. The mill and workings are shown in the foreground. No large production has so far been made. Veins are also being explored on the Tygerberg hills to the north of Capetown with encouraging results.

Nigel G.M. Co.

The returns from the Nigel mine for May are as follows: Gold, 4,550 ozs.; profit, £3,367, stamps working, 75; tons milled, 12,700.

Sheba G M. Co

The secretaries advise:—We have received the following cable from our London office: "Board of directors have declared a dividend of 5 per cent. on account of current year, payable on 18th July to the shareholders on the books 17th June."

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*By E. M. Weston, in the "Engineering and Mining Journal."

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EXCELLENT OUTPUTS AND PROFITS IN MAY.

Transvaal's Production Again Exceeds Three Millions Sterling—Group Earnings Compared with April Figures.

As we anticipated early in May the result of productive operations on the Witwatersrand last month was the output of a very much larger amount of gold than in April, with, of course, an attendant advance in the profit-earning of the mines. Elsewhere in this issue will be found a detailed statement of the essential statistical features of last month's operations, but the May figures are so eminently satisfactory that something more than the usual tabulated statement is on this occasion called for. In the first place it should be noted that the output for the whole of the Transvaal has been declared at the substantial total of 720,229 ozs., or in value £3,059,340. This is the first time since October of last year that the value of the total production has exceeded three millions sterling. The increase over the April total is 36,352 ozs., or in value £154,416. The Witwatersrand's total is 689,259 ozs., value £2,927,789. This means an increase of 33,651 ozs., or in value £142,947. Outside districts declare 30,970 ozs, value £131,551, giving an increase of 2,701 ozs., or in value £11,469. The fact that May contained one more working day than April naturally enough led one to anticipate a higher output, but quite apart from the fact that there was longer running time there are unmistakeable indications that the mines have recouped a good deal of the positions they held just previous to the July troubles, when the Transvaal output averaged over three and a third millions per month.

CORNER HOUSE AND GOLD FIELDS MINES.

To turn now to the outstanding features of the groups, the feature of the Central Mining—Rand Mines and the subsidiaries is that both touch the highest profits made this year, though that of the Central Mining companies is only a small margin above April. The subsidiaries under Rand Mines control, however, are up by £15,890 as compared with the previous month. It is noticeable about the Central Mining profits of £240,581 that they are the best since May of last year, when the figure was £241,645. This, of course, is highly interesting, inasmuch as it records a nearer approach to the normal, the normal, that is, always remembering that the mines have not their full complements of native labour. The best aggregate profit earned last year was the £255,230 in March. The Rand Mines subsidiaries, however, have still some way to go before they get near to the highest profits earned last year—the £280,177 of March. However, May's profits are the best since June of last year. As for individual profits of the Central Mining companies, the Village Deep and Robinson show the more interesting margins over April; while of the Rand Mines subsidiaries the advances of Crown Mines and of Nourse Mines are chiefly noteworthy. Knights Deep, with an advance in profit of five thousand over April, affords the most notable return in the Gold Fields group.

JOHANNESBURG CONSOLIDATED INVESTMENT CO

The Barnato Group continues its onward march, and the profit recorded in respect of last month's operations at £110,139 is the highest ever announced by this group. The April and March earnings were each a little over £104,000. The Van Ryn Deep heads the list both in regard to output and profit, the figures being £69,535 and £31,601 respectively. For the preceding month the output was £66,260 and the profit £32,007. The Consolidated Langlaagte and Witwatersrand also record substantial advances. The other subsidiaries fairly well maintain the results secured in the preceding month.

THE ALBU GROUP

In regard to companies under the control of the General Mining and Finance Corporation, a total aggregate profit for the group of £68,785 is announced, the revenue being £196,619. These figures compare very favourably with the April earnings when gold of a total value of £188,010 was produced and the net profit amounted to £61,719. The Aurora West, which, on account of an accident in the shaft, recorded a loss of £2,848 in respect of the April operations, recorded a profit of £4,687 for last month. The earnings of the other mines were about the same as in April. It is noteworthy that the working costs of the New Goch have been reduced to 14s. 3½d. per ton.

NEUMANN MINES.

The five productive mines comprising the Neumann group record a profit very much the same as in the preceding month, the May figure being £52,251 and that for April £52,427. The Consolidated Main Reef has improved its profit from £9,744 to £10,886. The most serious decline was in regard to the Knight Central. Profits at this mine were less than one-half of what they were in April, £1,205 as against £3,000. For the whole group the revenue in May was £182,472, and in April £175,914.

RANDFONTEIN AND THE LANGLAAGTE ESTATE.

As to the two "Robinson" companies—the Randfontein Central and Langlaagte Estate, the former mine shows an increase of 2,572 ozs. in output and £1,316 in profit. The "Estates" profit at £16,503 is nearly £1,500 better, whilst he total yield advanced from 13,690 to 14,785 fine ozs.

THE E.R.P.M., KLEINFONTEIN, AND BRAKPAN.

The East Rand Proprietary Mines, Ltd., records a total profit of £69,947 as compared with £63,983 for the preceding month, and the New Kleinfontein's May profit of £23,313 contrasts with £22,545 earned in April. At Brakpan the April profit was £18,194, and that for May £23,184.

THE GOERZ GROUP.

The mines of the Goerz group disclose an improvement of about £5,000 in value and £1,000 in profit. The May Consolidated and Princess Estate profits are slightly less, but the Geduld Proprietary crushed 20,010 tons as against 17,300 in April, and the output advanced from £28,216 to £31,686, and the profit from £6,691 to £8,151.

It will be clear from the foregoing that not only was May a month during which the production of gold eclipsed the output of the preceding six months, but that the profits earned by the mines were much better than have been recorded for a long time past.

Brakpan Mines.

The following is the result of operations at the Brakpan Mines for the month of May:—Stamps working, 140; running time, 27 days; ore crushed, 52,070 tons; tube mills working, 9; ore hoisted, 57,679 tons; ore from dump, 2,000 tons; waste sorted, 12·90 per cent.; fine gold declared, 17,117 ozs.; value declared, £72,120, equal to 27s. 8d. per ton milled; working costs, £48,936, equal to 18s. 9d. per ton milled, working profit, £23,181, equal to 8s. 11d. per ton milled.

Luipaardsvlei Estate.

The following is the result of this company's operations for the month ended 31st May, 1914:—60 stamps ran 30·284 days, crushed 17,900 tons, yielding 1,969 ounces fine gold; tube mill ran 30·193 days, yielding 733 ozs. fine gold; sands treated, 12,600 tons, yielding 1,398 ozs. fine gold; slimes treated, 5,300 tons, yielding 441 ozs. fine gold; profit from operations, £3,116; sundry revenue, £900; total profit, £4,016; working costs, 17s. 10d. per ton crushed.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

First Aid versus Safety First.

To the Editor, *South African Mining Journal.*

SIR,—As Dr. Irvine has asked me to confirm my observations of the effect of mine gases on the flame of an acetylene gas lamp, I must make another call on your generosity and ask for further space in your esteemed journal. About seven months ago we had a fatal gassing accident in an abandoned working place—part back-stope and part raise. A native had gone there, presumably to sleep or otherwise shirk work. Two white men and their boss boys made several attempts before they recovered the body, owing to being handicapped by their lights being repeatedly extinguished by "gas." A copy of the affidavit of those men can be obtained from the Mines Department. That the recovery of the dead native was effected without undue harm to those engaged goes to prove that the gas became fatal only after considerable exposure. In the light of this knowledge it is difficult to believe that it takes 50 per cent. CO_2 to extinguish a lamp flame. As the working place mentioned is now full of gas, Dr. Irvine can obtain full confirmation by making a personal inspection. An exploratory trip was made the other day, when the lamp flame disappeared—a number of attempts had been made to keep a candle alight a few yards lower down the raise. *Re* the laboratory test, I more than imagine that Dr. Irvine has drawn a wrong conclusion. He states "that the flame was extinguished by a mixture containing roughly of CO_2 50 per cent., O_2 10 per cent., and nitrogen 40 per cent." Was it the *large* percentage of carbon dioxide or the *small* percentage of oxygen which was the cause of this phenomenon? If Dr. Moir takes a mixture of gases with a smaller amount of CO_2 and not more than 10 per cent. O_2, as in his previous test, he will in all probability get a like result. I would suggest a mixture of 50 per cent. air with 50 per cent. of a black damp containing 20 per cent. CO_2, as given below:—

Air—
Nitrogen 79 × 50 = 39.5 per cent.
Oxygen 21 × 50 = 10.5 ..
Black Damp—
Nitrogen 80 × 50 = 40.0 .. ..
Carbon dioxide 20 × 50 = 10.0 .. ..

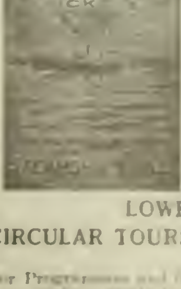
If we had a little more knowledge of the behaviour of a candle or lamp flame in different percentages of noxious gases we might find less need for the advice given on page 67 ("First Aid in Mining") to those who find their candle burns low or goes out: "No one should remain for a moment in such a place *even to extricate a man who has been gassed.*" (The italics are mine.) Safety First forsooth! Dr. Irvine treats the second point raised in my letter in a rather free and easy manner. He starts out on a circular path and arrives at the starting place only after making "confusion worse confounded." He tells us "that the gases mentioned exist *only* as a mixture and that a mixture of gases of different densities is not subject to the laws of gravity in the sense that sedimentation takes place in it in layers." On page 66 of "First Aid in Mining," we are informed that CO_2 is a heavy gas, considerably heavier than air (Sp. Gr. 1·52) and *hence* it tends to remain at the *bottom* of close or deep workings, or it may drift along from a drive and settle in the nearest winze. (No mixture about this!) We are further told that the deadly gases (a "mixture" granted) found in winzes have a specific gravity of "1·1 or thereabouts." This tempts me to repeat what was indirectly a query in my last letter: "This again precludes the probability of finding carbon dioxide in raises or backstopes"—or "other close places," as Dr. Irvine designates them. The word "versus" does not fit snugly, I know, between "First Aid" and "Safety First." Owing, however, to ambiguity or incomplete information in our ambulance literature, we are more than likely to sacrifice life which, you will admit, is very much "versus" Safety First.—Yours, etc.,

W. LACEY.

West Rand.

Haggar and the Natives.

The inconsistencies of some of our so-called Socialistic leaders have seldom been more luridly exemplified than in Capetown during the past week. Mr. Booth, a Nyasaland missionary, has arrived in the Cape Peninsula with a native of the Lake Protectorate, and has, according to the Daily Press, been preaching at the street corners in favour of the amelioration of natives in Nyasaland and of the granting to them of certain privileges which are tantamount to equal rights with the whites. The couple are taking to England a petition in support of their desires. We note that Mr. Haggar, our well-known Labour leader and M.L.A., has associated himself prominently with the movement and petition. It is passing strange that a member of the party which opposes industrial emancipation in the Transvaal should identify himself with a campaign having as its object a far more pronounced effort to equalise the races in Nyasaland. But this is after all but one of the many inconsistencies that are so noticeable in the political propaganda of the Labour leaders.



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THE MAY GOLD OUTPUT IN DETAIL.

Substantial Increase over April—Some Excellent Features.

The following are the salient figures of the May output, as declared this week by the Chamber of Mines:

Total output	720,229 ozs.
Value	£3,059,340
Increase	36,352 ozs.
Value	£154,416
Witwatersrand	689,259 ozs.
Value	£2,927,789
Increase	33,651 ozs.
Value	£142,947
Outside Districts	30,970 ozs.
Value	£131,551
Increase	2,701 ozs.
Value	£11,469
Total Stamps	9,773
Increase	78
Witwatersrand	9,220
Increase	45
Outside Districts	553
Increase	33

The results for the month are reviewed in detail elsewhere in this issue. The list of increases and decreases is as follows:—

The Witwatersrand.

	April. £	May. £	Increase. £	Decrease. £
Aurora West	11,702	18,167	6,465	—
City and Suburban	49,558	52,952	3,394	—
City Deep	84,415	86,624	2,209	—
Consolidated Langlaagtes... ...	58,950	65,479	6,529	—
Durban Roodepoort	14,468	15,041	573	—
Ferreira Deep	112,463	113,134	7,671	—
Geduld Prop.	28,286	31,769	3,483	—
Ginsberg	17,981	16,982	—	999
Glencairn	15,084	15,691	607	—
Langlaagte Estates...	58,251	62,803	4,652	—
Luipaardsvlei	18,788	19,289	501	—
May Consolidated	8,835	9,672	837	—
Meyer and Charlton	34,326	35,027	701	—
New Goch...	32,206	32,686	480	—
Nourse Mines	57,693	62,913	5.220	—
New Kleinfontein	68,970	70.117	1,147	—
New Modderfontein	92,558	90,400	—	2,158
New Primrose	26,119	25,988	—	131
New Rietfontein	6,643	7.094	451	—
New Unified	14,085	14.340	255	—
Princess Estate	28,557	29,127	570	—
Roodepoort United M.R.	21,888	23,239	1,351	—
Randfontein Central	253,353	254,278	10,925	—
Spes Bona Tribute...	5.114	5.811	697	—
Van Ryn Estate	54,048	53.581	—	467
Van Ryn Deep	66,260	69,535	3,275	—
West Rand Consolidated... ...	33,638	34.020	382	—
Witwatersrand	47,676	50,463	2,787	—
Durban Roodepoort Deep... ...	33,799	39,066	5,267	—
Geldenhuis Deep	67,683	70.504	2,821	—
Brakpan Mines	66,192	72,708	6,516	—
Knight Central	23,078	22.628	—	450
Wit. Deep	56,431	57,871	1.440	—
Wolhuter	42,239	42,448	209	—
Bantjes Consolidated	27.644	26.859	—	785
Crown Mines	247,001	268,491	21.490	—
E.R.P.M.	213.381	224.318	10,937	—
Knights Deep	69.454	77,423	7,969	—
New Heriot	23.456	24.220	764	—
Robinson	87,346	92.282	4.936	--
Robinson Deep	58,933	66.787	7,854	—
Rose Deep	84,793	83.464	—	1,329
Simmer and Jack	60.823	59.766	—	1,057
Simmer Deep	40.515	43.654	3.139	—
Village Deep	70.262	74.701	4,439	—
Village Main Reef	63,745	62.769	—	976
Vogels. Estate	14.472	15,164	692	—
West Rand Central	4.167	4.001	—	166
Consolidated Main Reef	31,998	35,061	3,063	—
Main Reef West	24,216	26,451	2,235	—
Outside Districts.				
Ceylon Lydenburg	1,058	1,066	8	—
Glynn's Lydenburg	8,678	8.920	242	—
Quest	2,808	3.080	272	—
T.G.M. Estates	35,881	39.032	3.151	—
Worcester Exploration	3.959	4.672	713	—
Nigel	19.930	19.327	—	603
Sub-Nigel	9,222	9.506	284	—

THE LABOUR POSITION.

1914.	Gold Mines.	Coal Mines.	Diamond Mines.	Total.
January	154,202	9,471	11,979	175,652
February	157,673	9,508	12,266	179,447
March	162,815	9,619	13,390	185,824
April	165,005	9,625	14,150	188,780
May	165,561	9,625	14,150	189,336

STAMPS AT WORK.

1914.	Rand.	Outside.	Total.
January...	9,035	545	9,580
February	9,100	548	9,648
March	9,120	542	9,662
May	9,220	553	9,773

TUBE MILLS AT WORK.

1914.	Rand.	Outside.	Total.
January	277	9	286
February	280	9	289
March	280	9	289
April	281	9	290

PROFITS.

The aggregate working profits of the produeing mines of the various groups for May are as under:—

Rand Mines	£231,378
Central Mining...	240,581
Barnato...	110,139
Gold Fields	70,736
East Rand Proprietary Mines	69,947
Albu...	68,785
Neumann	52,251
Kleinfontein	23,314
C.M.S. (Brakpan)	23,184
Goerz	10,894
Robinson	89,126
Total	£990,335

TWELVE LEADING COMPANIES.

The following are the twelve largest producers for the month:—

	Tons milled.	Ozs.	£.
Crown Mines...	204,000	63,208	268,491
Randfontein Central	216,590	59,862	254,278
East Rand Prop. Mines...	151,500	52,809	224,318
Ferreira Deep	61,300	26,634	113,134
Robinson	55,700	21,725	92,280
New Modderfontein	52,250	21,282	90,400
City Deep	43,200	20,393	86,624
Rose Deep...	66,200	19,649	83,464
Knights Deep	102.600	18,227	77,423
Village Deep	52,500	17,586	74,701
Brakpan	52,070	17,117	72,708
Geldenhuis	52.200	16,598	70,504

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

The Witwatersrand.

Company.	Tons Milled.	No. of Stamps.	Tube Mills.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West . . .	14,920	80	—	4,277	18,107
Bantjes Consolidated	22.500	100	3	6,323	26,859
Brakpan Mines...	51,070	140	9	17.117	72,708
City Deep	43.200	150	9	20,393	86,624
City and Suburban	29,100	155	2	12,466	52,952
Con. Langlaagte Mines ..	51,800	100	10	15,415	65.479
Con. Main Reef	2,000	100	3	8.254	35.061
Crown Mines	64,000	660	24	63,208	268.491
Durban Roodepoort	14.377	90	1	3,541	15.041
Rurban Roodepoort Deep.	27,340	100	3	9.097	39.066
East Rand Prop. Mines ...	151,500	820	25	52,809	224,318

Company.	Tons Milled.	No. of Stamps.	Tube Mills.	Total Gold obtained. Fine Ozs.	Total value.
Ferreira Deep	61.300	280	7	26.634	113.134
Geldenhuis Deep	52.200	300	7	16.593	70.504
Ginsberg	15.016	75	1	3.998	16.932
Glencairn Main Reef	21,816	60	-	3.694	15.691
Geduld Prop. Mines	20.010	50	5	7.479	31,769
Knights Deep	102.600	400	11	18.227	77.123
Knight Central	20.500	90	3	5.327	22.628
Langlaagte Estate	55.002	200	5	14.785	62.803
Luipaardsvlei Estate	17.9[illegible]	60	3	4.541	9.289
Main Reef West	19.1[illegible]	100	3	6.227	26.451
May Consolidated	13,110	100	-	2.277	9.672
Meyer and Charlton	14.950	75	2	8.246	35.027
Modder "B"	35.500	80	5	11.917	63.363
New Goch	30.700	120	4	7.095	32.686
New Heriot	13.1[illegible]	70	1	5.702	24.220
New Kleinfontein	52.700	200	4	16.507	70.117
New Modderfontein	52.250	180	7	21.282	90.400
New Primrose	23.300	155	2	6.118	25.958
New Rietfontein Estate	7.284	110	-	1.670	7.094
New Unified	12.760	60	1	3.376	14.340
Nourse Mines	47.700	260	7	14.811	62.913
Princess Estate	22.300	60	5	6.857	29.127
Robinson	55.700	250	6	21,725	92.282
Robinson Deep	40.580	115	9	15,723	66.787
Randfontein Central	210,590	950	29	59.862	254.278
Roodepoort U.M. Reef	24.600	55	3	5.471	20.239
Rose Deep	66.200	300	7	19.649	83.464
Simmer Deep	49.250	180	9	10.277	43.654
Simmer and Jack	58.500	320	7	14.070	59.766
Star Rosa Tribute	6.290	40	-	1.368	5.811
Van Ryn Deep	42.080	80	8	16.370	69.535
Van Ryn Gold Mines	39.600	140	6	12.614	53.531
Village Deep	52.500	180	7	17.586	74.701
Village Main Reef	33,000	160	4	14.777	62.769
Vogelstruis Estates	12.354	70	-	3.570	15.164
West Rand Central	2.[illegible]	20	1	942	4.001
West Rand Con.	[illegible]	100	4	8.[illegible]09	34.020
Witwatersrand	42.180	210	4	11.880	50.463
Wit. Deep	45.430	245	5	13,624	57,871
Wolhuter	34.100	120	4	9.993	42.448
Miscellaneous Producers	—	—	—	—	7.568
Outside Districts.					
HEIDELBERG—					
Nigel	12.700	75	1	4.550	19.327
Sub Nigel	4.750	25	1	2.238	9.506
BARBERTON—					
Barrett	—	—	—	268	1.138
Sheba	7.010	65	—	3.296	14.001
Worcester Exploration	6.250	40	2	1.100	4.672
LYDENBURG—					
Carbon Lydenburg	716	5	-	251	1,066
Glynn's Lydenburg	3,998	20	1	2.100	8.920
Transvaal G.M. Estates	15.250	75	3	9.189	39.032
KLERKSDORP—					
Q[illegible]	4.435	35	-	725	3.080
Miscellaneous Producers	—	—	—	—	30.809

Barnato Group.

The following are the operations of the Barnato Group for the month of May:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.	Gross Profit including sundry Revenue.
Cons. Langlaagte	100	51,800	£65,178	£25,079
Ginsberg	75	15,016	16,983	3,218
Glencairn	100	21,846	15,691	2,831
New Primrose	155	23,300	25,988	11,327
New Rietfontein	55	7,284	7,092	1,059
New Unified	60	12,760	14,342	5,203
Q[illegible]	35	4,435	3,080	509
Van Ryn Deep	80	42,080	69,535	34,601
Witwatersrand	210	42,180	50,463	25,318
May totals	930	229,701	£268,652	£110,139
April totals	920	206,735	£255,612	£104,193

Monthly gross profits: January, £87,277; February, £94,055; March, £101,704; April, £104,193; May £110,139.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of May:—

Company	No. of Stamps Running.	Tube Mills	Tons crushed	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	66,200	17/ 1	19,649	£25,603
Geldenhuis Deep	300	7	52,200	22/ 4	16,598	11,433
Nourse Mines ...	260	7	47,700	19/ 3	14,811	16,279
Ferreira Deep ...	280	7	61,300	16/10	26,634	60,042
Crown Mines ...	660	26	204,000	15/ 1	63,208	111,113
Durban Rood. D.	100	3	27,340	23/ 2	9,198	6,908
Totals & averages	1900	57	458,740	17/ 4	150,098	£231,378

The following are the results of crushing operations of Central Mining companies for the month of May:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	35,000	15/ 6	14,917	£35,488
New Modder ...	180	7	52,250	15/ 6	21,282	48,873
City Deep	150	9	43,200	22/ 8	20,393	36,265
Village Deep ...	180	7	52,500	16/ 7	17,586	30,104
Village Main Reef	160	6	33,000	17/ 8	14,777	32,566
Robinson	250	6	55,700	13/ 6	21,725	53,575
Bantjes Cons. ..	100	3	22,500	20/ 3	6,323	3,710
Totals & averages	1100	43	294,150	17/ 0	117,003	£240,581

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of May, 1914, of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	58,500	14,870	£24,815
Robinson Deep ...	115	9	46,580	15,223	25,385
Knights Deep ...	400	11	102,600	18,227	15,068
Simmer Deep ...	180	9	49,250	10,037	3,143
Sub Nigel	25	1	4,750	2,238	2,325
Totals	1040	37	261,680	60,595	£70,736

Total gold in reserve: Simmer and Jack, 1,450 ozs.; Robinson Deep, 2,366 ozs.; Knights Deep, nil; Simmer Deep, 1,167 ozs.; Sub Nigel, 900 ozs.; total, 6,183 ozs.

The sundry revenue included in the above total declared profits is as under: Simmer and Jack, £2,506; Robinson Deep, £306; Knights Deep, £206; Simmer Deep, £310; Sub Nigel, £265; total, £3,588.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of May, 1914:—

	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ..	100	—	13,110	£9,650	£443
Princess Estate	60	5	22,300	29,054	2,300
Geduld Proprietary ...	50	5	20,010	31,686	8,151
	210	10	55,120	£70,390	£10,894

Albu Group.

The following are the details of results regarding the May operations of the producing mines of the General Mining and Finance Corporation Group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,920	£13,495
Meyer and Charlton	75	14,950	12,688
New Goch	120	30,700	21,949
Roodepoort United	55	24,600	21,972
Van Ryn	140	39,600	30,836
West Rand Consolidated ...	100	26,800	26,924
	570	151,570	£127,864

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	18/ 1·1	£18,182	£4,687
Meyer and Charlton	16/11·7	35,015	22,327
New Goch	14/ 3·6	32,634	10,685
Roodepoort United	17/10·4	23,276	1,304
Van Ryn	15/ 6·9	53,484	22,648
West Rand Consolidated ...	20/ 1·1	34,058	7,134
		£196,649	£68,785

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	45,420	£57,278	£21,018
Wolhuter	34,100	41,965	14,245
Consolidated Main Reef...	22,000	34,710	10,886
Main Reef West	19,020	26,165	4,897
Knight Central	20,500	22,354	1,205
Total for Group ...		£182,472	£52,251

Robinson Group.

The results of the Robinson group for May are as follows: Langlaagte Estate: Tons milled, 53,002; total yield, 14,785 fine ozs.; estimated profit, £16,503; per ton milled, 6s. 2·73d. Randfontein Central: Tons milled, 216,590; total yield, 59,862 fine ozs.; estimated profit, £72,623; per ton milled, 6s. 8·47d.

Zaaiplaats Tin.

The following are the results of the above company for the month of May, 1914:—Days run, 26·6 days; ore milled, 3,732 short tons; residues re-treated, 2,244 short tons; concentrates won, 102 long tons; average value of concentrates, 67·1 per cent. metallic tin; estimated profit for the month, excluding Government Tax on profits, £2,567 3s. 2d.; add adjustments in respect of estimated values of previous shipments, £68 1s. 5d.; profit declared for the month, £2,635 4s. 7d.; capital expenditure, £436 19s. 1d.

QUARTERLY REPORT.

The directors' report for the quarter ended 30th April, 1914, states:—15 stamps ran 78.5 days, crushing 10,283 short tons, the duty per stamp being 9.1 tons per 24 hours. In addition, 5,985 short tons of sands and slimes residues were re-treated, while 24,220 tons of alluvium were dealt with in the separate plants designed for this purpose The output for the quarter amounted to 297 long tons of concentrates, assaying 67.4% Met. Tin, as compared with 294 long tons produced during the previous quarter. The estimated profit for the quarter amounted to £11,498 5s. 2d., made up as follows:—Estimated profit for the three months' operations, £12,656 14s. 1d.; less adjustments of estimated values of shipments to 23rd January, 1914, £1,158 8s. 11d.; profit declared for the quarter, £11,498 5s. 2d. The average price obtained per ton of metal was £164 18s. 9d. *No. 2 Section.*—The small ore bodies maintain a high average value. A new branch discovered recently has increased the productiveness of the section. *No. 5 Section.*—Advantage has been taken of the transfer of the main haulage to explore the footwall. The work has been rewarded by the discovery of several valuable branch bodies. Two new high grade ore bodies were also discovered in the hanging wall. Nothing can be said at this juncture in regard to the prospects of the continuity of these bodies beyond that they have a very strong appearance. *No 6 Section.*—The main haulage incline was put into working order. This has facilitated the removal of broken rock from the Eastern Section, where exploration work was hampered considerably. The prospects are good and the work of exploration is being pushed ahead. The main ore body has become associated with a fissure and is dipping steeply. No change in the value occurred. *No. 13 Section.*—The upper level ore body has shown a steady improvement and at the end of the quarter had a very fine face of ore averaging about 7% M.T. and measuring 53ft. x 6ft. The ore body at the incline depth of its present face—1,400ft.—is as valuable and vigorous as at any time since its discovery. *Roodepoort Lease.*—The only working face is in the upper section of No. 6, where an erratic but payable ore body is being worked. During the quarter 11,151 tons of ore were mined and disposed of as follows:—Apportioned to Transvaal Consolidated Land Co., 233; waste sorted, 1,783; sent to mill, 10,283—12,299; less taken from reserve dumps, 1,148; total, 11,151 tons. *Surface Prospecting.*—Three small "eyes" were discovered during the course of stripping the overburden. These have not increased in value. The concentrates won from the treatment of the overburden by the alluvial plants amounted to 28 long tons, averaging 67% M.T. *Machinery, Plant and Buildings.*—In addition to several minor alterations and improvements, No. 4 alluvial plant has been brought into commission, three new single quarters have been erected, and a slime dumping pump has been installed. A new 600ft. compressor is being erected, and, in addition to supplying the increased requirements of air underground, will form a useful stand-by in case of emergency. Two new concentrating tables (the "Diester" and the "Isbell") are in the course of erection. *Capital Expenditure.*—The net expenditure charged during the quarter to capital account amounted to £1,228 1s. 1d., made up as follows: Machinery and plant, £901 10s.; buildings, £158 11s. 8d.; reservoirs, dams and water service, £167 19s. 5d.; total, £1,228 1s. 1d. *Native Labour.*—Since the early part of March the supply has been in excess of the demand, and no anxiety is at present being felt on this question. *Water Supply.*—The rainfall for the quarter amounted to 10.59 ins., and the supply is ample for all purposes. *Dividend No. 15.*—An interim dividend of 20% (1s. per share) has been declared during the quarter. This dividend is payable to all shareholders registered in the books of the company at the close of business on the 30th April, 1914. Warrants will be posted during the first week in June.

It is generally known that the connection of the Atlantic and Pacific Oceans by means of the Panama Canal is to be celebrated in San Francisco next year by an international exposition in which many of the leading countries of the world are taking part. Every effort is being made to produce an exposition which will worthily represent so great an event as the completion of the Panama Canal, and we learn that of the many exhibits that of the United States Steel Corporation and its subsidiary companies will be of exceptional interest, in that it will not only demonstrate the manufacture of steel in all its many branches, but also the welfare work and the "Safety First" movement which is being carried out for the benefit of its vast army of employees numbering over 200,000. The various manufacturing processes will begin with the ore fields and depict the many operations of ore mining, loading and unloading of ore vessels, coal, coke and pig iron production, and steel manufacturing in its various lines. There will also be an exhibit of a large variety of finished materials which are manufactured from steel and other metals. Another interesting feature will be the utilisation of by-products, and the display of many of the ways in which the general manufactured articles are employed for the purpose of typifying the advancement in the uses of the resources of the United States of America. It is the intention of the United States Steel Corporation to exhibit in a comprehensive manner, by means of moving pictures, its operations throughout all departments. As is well known, the United States Steel Corporation has been one of the prime movers in social welfare work as affecting its employees and those depending upon them, and this work will form a feature of the exhibit. Furthermore, the many forms of safety devices which have been conceived by the Corporation's officials and employees will be shown. Particulars will also be given in a graphic manner of the methods employed by the Corporation in the first aid of and care for the injured, as well as the welfare of employees whilst at work.

Rezende Mines.

The results for the month of May, 1914, are as follows: Estimated profit: Central Section, £1,832; Old West Workings and Penhalonga Sections, £1,244; total £3,076. Note: The board of directors in London have declared a final dividend of 7½ per cent. for 1913, making 15 per cent. for the year. Warrants were posted to shareholders on May 29th last.

Rhodesian Section.

LATEST MINING NEWS.

Chamber of Mines Report—The Mining Law Amendment Ordinance—Eldorado Banket—The Wanderer—Globe and Phoenix—The Bushtick.

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of April includes the following:—Finance.—Receipts during the month amounted to £38 7s. 6d., and payments of £164 18s. The balance to credit of current account at the 30th April was £106 5s. 9d. Fixed deposits totalled £700. Native Labour.—The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of February and March, 1914:—

	February.	March.
Local	9.888	10,666
Portuguese Territory	6.684	6,931
N.W. Rhodesia	4,018	4,383
N.E. Rhodesia	5,562	5,595
Nyasaland	7,467	7,175
Other Sources	867	852
	34,486	35,602

The number employed in March, 1914, shows an increase of 3.238 as compared with the same month of 1913. Increases are from Portuguese Territory and Nyasaland, while local, N.E. Rhodesia and other sources show decreases.

* * * *

The Legislative Council of Southern Rhodesia resumed its sitting in Salisbury on Monday afternoon. The Treasurer, referring to the constitutional crisis caused by the Administrator refusing assent to the Mining Law Amendment Ordinance, on which the Council adjourned recently, said that notwithstanding the fact that the amendment to Ordinance was in interference with the rights of the Chartered Company, after the consideration of the question at issue the company did not consider it necessary to take any action which would inconvenience the mining industry. The Administrator therefore consented to the Ordinance. The Ordinance passed its third reading.

* * * *

Two cables were dispatched from the local to the London office of the Eldorado Banket Company in mail week as follows:—"Referring to telegram April 30, No. 13 level first 30 ins. assays 14,900 dwts., face cross-cut looks well. Referring to the foregoing telegram, No. 13 level Main Reef has been fully exposed in main cross-cut north, assaying 10¼ dwts. per ton over 132 ins

* * * *

Of the 136 feet of development work accomplished on the Wanderer (Selukwe) during March, 267 feet were in the south section of the Wanderer. On the adit level the main drive south is still in barren zone. The footwall drive, however, is more encouraging. The 70 ft. level and cross-cuts have been discouraging throughout the month. The 110 ft. level drive is at present in the oxidised zone, and has improved. No further ore has been exposed in the Kemerton and Ashton sections during the month. There are indications, however, that a little more may be obtained.

* * * *

The London secretary of the Globe and Phoenix Gold Mining Company announced in mail week that the following cable had been received from the mine:—"Mill crushed 6,203 tons, fine gold, 8,000 ozs. This gives a profit of £20,000 over and above expenses, including reserves, approximately. We expect will make air connections according to instructions about May 16. Government issued imperative order to the effect limiting us to eight hours' stamping to bank two shifts per day; consequently we have to reduce labour force by 200 hammers. In view of new Government instruction about hours underground working, do not expect able to do as well as April—say, 6,000 tons and £15,000 profit approximately until Government instructions are removed." The secretary adds: "It will be seen from the above cable that the connection with the new vertical shaft will be made in about a fortnight, and on this being done the directors anticipate the Government embargo will be removed and normal working will be resumed."

* * * *

The Bushtick property was formerly equipped with twenty Californian stamps and a Chilian mill, with two small tube mills. It was found that the plant dealt with insufficient tonnage, and in the beginning of 1913 the treatment plant was modernised by the addition of eight Nissen stamps and one large tube mill, 16ft. 6in. by 6ft. diameter, since when the amount of rock crushed has been increased to 6,300 tons per month. The new stamps, tube, and modernised cyanide plant have permitted a considerable reduction in the cost of working. A still further increase in the monthly crushing is contemplated; this, however, will entail a re-organisation of the power plant for hauling, as well as for milling. Development during the past year has been actively exploited, proving the lode at the lowest level to average 7 dwts. per ton over a width of about 12 feet for a distance of 550 feet, the drive-face being still in average value. The cost of working at the Bushtick is known to be particularly low, and on the increased basis of working is not expected to exceed 11s. per ton.

* * * *

The annual general meeting of the Antelope Gold Mine (Rhodesia), Limited, was held in mail week at the Cannon Street Hotel, E.C. Mr. R. G. Fricker presided, and moved the adoption of the report for 1913. He said it was originally intended to find the money necessary to complete the plant, and bring the mine to the crushing stage, for which about £60,000 was required, by the realisation of some of their investments, but owing to the state of the markets this had been impossible, and they had had to negotiate a loan for the necessary amount with the Gold Fields Rhodesian Development Company. The report was adopted.

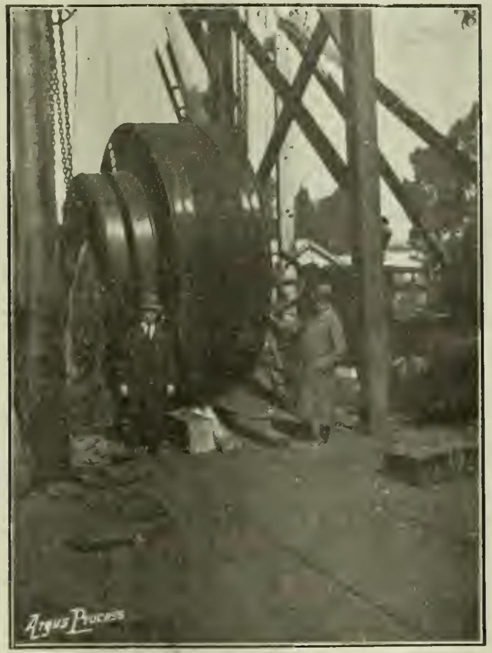
* * * *

The Rhodesia Copper and General Exploration and Finance Company, Ltd. (and reduced), has issued a circular to shareholders stating that the resolution for a reduction of capital has received the sanction of the Court, and the directors are therefore in a position to distribute in redemption of capital among the holders of 1,172,512 shares which have been issued, rateably in proportion to shares held by them on May 18, 1914, the following shares in subsidiary companies and cash, viz., 293,128 fully-paid shares of 10s. each of the Bwana M'Kubwa Copper Mining Company, Ltd.; 53,296 fully-paid shares of 5s. each of the Rhodesia Broken Hill Development Company, Ltd.; 53,296 fully-paid shares of £1 each of the Kafue Copper Development Company, Ltd.; and £14,656 8s. in cash.

Engineering Notes and News.

Transporting a Large Armature.

A large Ward-Leonard winder has lately been purchased by the Modder B. G.M. Co. for the central shaft of this mine, and the photograph reproduced herewith depicts the armature of the winding motor. This photograph is interesting from the fact that, so far as we can trace, it is the largest armature to be brought into this country in one piece. The case in which this armature was packed had to be entirely dismantled at Durban, and the armature built in its normal state into a special well-truck, and then boarded over. This well-truck had also to be specially altered by the Railway Administration to accommodate the armature, as none of their standard trucks were suitable. Even under these conditions, the net clearance between the top of the armature and the Laing's Nek tunnel was only one inch, which clearance is the minimum allowed by the Railway Administration. Further, in order to safeguard the armature during transit, it was necessary to have a mechanic accompanying the truck throughout the journey, and it was, of course, only possible to travel during the day time. The following particulars regarding the armature have been furnished to us by Messrs. Siemens, Ltd., who supplied it:—Diameter, 11 ft. 1 in.; net weight (without shaft), 23 long tons; net weight (with shaft), 26 long tons.

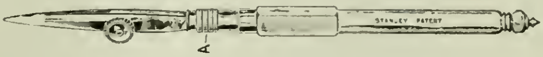


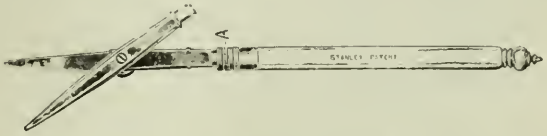
Treatment Plant at the Antelope Mine.

At the Antelope gold mine, Rhodesia, the ore treatment plant, consisting of two Krupp ball mills (No. 8), four Edward's roasting furnaces, 12 grinding pans, agitators, filter presses, etc., was completed about the middle of November last. The whole of the plant is run electrically, the power plant consisting of two 220 h.p. Babcock and Wilcox W.T. boilers and one 300 h.p. condensing engine, direct coupled to a Westinghouse generator. This being the first dry crushing and roasting plant completed in Rhodesia, it was only to be expected that both white and native labour, accustomed to the much simpler standard type of wet milling plant, would take some little time to become efficient at the new work. Apart from this factor, on this type of plant a far greater amount of small adjustments are necessary after the plant may be considered erected. For these reasons a real start was not made much before the middle of December, although trial runs of certain sections had been commenced nearly two months before. According to the manager, Mr. A. J. Fraser, the only defect found in the plant which could be really material was the inability of the pans to do the amount of work required and expected of them. "At date (18th February) we are still continuing to run with this installation, but the effect is felt very detrimentally, not only in decreased tonnage, but in a coarser product, which entails higher residues and increased wear in filter pressing spares. In view of the fact that, in spite of every effort to increase the duty of the pans, but little success has been met with, it has been decided to instal a tube mill to replace them," the estimated cost of the new equipment complete being £1,250.

A New Drawing Pen.

Messrs. W. F. Stanley & Co., Ltd., have placed on the market a new patent swivel nib drawing pen, which will be found a great improvement on the older forms of drawing pens, as the nibs can be instantly opened out for cleaning and afterwards replaced without interfering in any way with the original adjustment of the thickness of line. In construction the lower nib is swivelled upon a central screw, and when the pen is in use this is held in position by the ring A. To open for cleaning it is only necessary to slide back the ring and open out the nib as shown in the second illustration, after which the nib and ring are replaced, which automatically readjusts the pen to its original setting. The pen is made in two sizes—large about 6 inches long, small about 5 inches.





Drums for Winding Plants.

The choice of drums for steam or electrical drive is a matter which most Witwatersrand engineers have had to consider at one time or another, particularly since the wholesale adoption of electrical power for driving winding engines on the Rand. The subject is discussed at considerable length in the issue of the *Mining and Scientific Press* to hand by this mail, by Messrs. C. A. Ablett and H. M. Lyons. In bringing a very thoughtful contribution to a conclusion, the authors state:—Generally speaking, we are of opinion that the Ward Leonard or Ilgner system of electric winding is the most suitable for vertical shafts, and for all cases where large outputs are required and short and frequent winds are made. The three-phase winder always has the disadvantage that it cannot be so completely protected against careless handling as either the Ward Leonard or the Ilgner, but it may prove more economical for long slopes where the full speed run is a long one and the periods of acceleration are comparatively infrequent. Regarding the choice of drums for the winding engine, we are of opinion that in many cases where electrical drive is adopted, the cylindrical drum winder will prove the most suitable, but that in cases of deep shafts where the winding speed is high the scroll drum winder may prove better than the cylindrical drum winder, but that the field of application of the conical drum winder to electric winding is very small. The following table shows the influence of the different types of drums on the electrically-driven winding engine:—

Depth, 1,600 feet.	Output, 270 tons per hour.			
	Cylindrical Drum.	Conical Drum.	Scroll Drum.	Koepe Pulley.
Power of motor	1,090	965	780	935
Speed of motor ...	81	66	62·7	97
Horse-power per revolution	13	14·6	12·4	9·6
Maximum peak with Ward Leonard system	1,865	1,690	1,390	1,276
Average loss of power with three-phase system hp. ...	325	260	170	341

How South Africa's Water Wealth is Wasted.

The waste of South Africa's water wealth was deplored by Mr. W. Ingham, Chief Engineer of the Rand Water Board, at a recent meeting of the South African Institution of Engineers. The subject of discussion was Mr. F. K. Steven's paper entitled "Irrigation, with special reference to the future of South Africa." Mr. Ingham maintained that we are only in our infancy in this country with regard to the conservation of our rivers, and expressed the view that the sooner we wake up to the fact that money is rolling into the sea every day, the better it will be for South Africa. Figures he quoted showed that the bulk of the water of the Vaal River, for example, flows into the Atlantic—a waste represented by millions of millions of gallons. He pointed out a remedy in the successful conservation methods adopted in countries similar to our own. Mr. Ingham, in illustrating at the outset of his speech the possibilities of farming, said that nearly six years since a friend and he purchased [illegible] acres of land for £2,700. They spent on development a further £3,300. About twelve months ago, owing to the fact that he personally could not give the time to the farm that he would like to, his partner and he decided to sell. For the land alone they received £12,000, and for their stock a little more than £2,000, making a price of £14,000 for a farm on which they had spent £6,000, or a profit of £4,000 each. Nearly 166 acres were cultivated, 135 being under lucerne and the balance under fruit. The undeveloped land panned out at about £180 per morgen. That price had been a very common one in the Sundays River Valley and in the Oudtshoorn district. As to the Sundays River scheme, there would be 20,000 acres under cultivation within the next few years. Closer settlement would no doubt have a place in those 20,000 acres. He had recommended the directorate of a certain company to make some arrangement for a certain class of men on the Rand, more particularly for men suffering from miners' phthisis. Some men would want money to start with, but he had recommended that for the first year they should be charged only interest on their capital. At the end of the first year they should pay a third, and in the second and third years similar proportions; they would then become the owners of the land. The Government were lending money at 3¾ per cent. for irrigation projects. They were further prepared to give a thirty years' loan, which altogether would mean, including redemption and interest, six per cent. on the total money borrowed. They were losing nearly a half per cent. on that loan. Whether that was fair to the country was quite another matter—that was politics; but for his part he could not see why the rest of the country should be penalised to the extent of nearly a half per cent. to improve other people's land. He thought himself that if they wanted to develop the country, the proper basis was to charge the interest they were paying themselves, and a certain proportion for the working of the loan itself. Farmers to-day were paying between seven and ten per cent., and if they could get the money for 4½ per cent. they would, he thought, be well satisfied. A living could be made from twenty acres of ground properly cultivated. Mr. Braidwood and Mr. D. G. Greig also contributed to the discussion. Mr. Braidwood showed how much the development of the agricultural industry lay in engineering. Mr. Greig, who had been invited to give members the benefit of his ten years' experience as a farmer, explained a practical experiment he had made in the conservation of rainfall through not burning grasses on his farm in the Eastern Transvaal. He had seen no diminution in the springs on the catchment area on which the veld had not been burned. Land fertilised by flood water could support a very large number of people. Mr. Greig went on to show that a comfortable living could be made from the cultivation of fifty acres of land, and that engineers would take an important part in the reduction of farming costs.

New Companies.

Below is a list of new companies registered during May:—

Pretoria Industrial Co-operative Co., Ltd., 283, Pretorius Street, Pretoria; capital, £1,500.

B. van [illegible], Ltd., No. 217, Pretorius Street, Pretoria; capital £6,500.

White [illegible], Ltd., care of Sand and Co., Sand's Buildings, corner of Carr and Goch Streets, Newtown; capital, £3,000.

Formosa Gold Mining and Prospecting Co., Ltd., 82-84, Exploration Buildings, Johannesburg; capital, £25,000.

A. J. de Vogel and Co., Ltd., Erf No. 91, corner of Queen and Parkwood Streets, Lake Chrissie, District Ermelo; capital, £1,000.

African Estates and Exploration Co., Ltd., 20, Natal Buildings, Commissioner Street, Johannesburg; capital, £10,000.

Barry Syndicate, Ltd., [illegible], Exploration Buildings, Johannesburg; capital, £500.

The African Arcade, Ltd., the African Arcade, Erf 421, Pretorius Street, Pretoria; capital, £3,000.

Flats, Ltd., [illegible], Loveday Street, Johannesburg; capital, £1,000.

[illegible] and Co., Ltd., Estate Buildings, Fox Street, Johannesburg; capital, £1,000.

The Vrededorp Trading Co., stand 742, corner 17th and De La Rey Streets, Vrededorp; capital, £50.

The Caledonian Society of Johannesburg, Ltd., the Caledonian Club, corner Jeppe and [illegible] Streets, Johannesburg; capital, £7.

H. Kahn and Co., Ltd., 17, Heywood's Arcade, Pritchard and President Streets, Johannesburg; capital, £1,000.

The Farmers' General Trading Co., Ltd., [illegible] Buildings, Pim Street, Newtown, Johannesburg; capital, £10,000.

Foreign Companies Registered.

[illegible], care of Marcus [illegible], [illegible] Pritchard Street, Johannesburg; capital, 1,000,000 gulden.

A. and J. [illegible] and Co. (S.A.), Ltd., care of Robert [illegible], [illegible] Buildings, Johannesburg; capital, £50,000.

Increases of Capital.

New Kleinfontein Co., Ltd., Johannesburg, from £970,000 to £1,151,540.

Bokkraal Development Co., Ltd., Johannesburg, from £4,800 to £6,400.

West Rand Fresh Meat Co., Ltd., Krugersdorp, from £5,000 to £8,000.

African Guarantee and Indemnity Co., Ltd., Johannesburg, from £50,000 to £250,000.

Geduld Proprietary Mines, Ltd., Johannesburg, from £875,000 to £922,500.

Pretoria Detinning Co., Ltd., Pretoria, from £500 to £1,400.

In Liquidation.

Golden Hills Proprietary Mines, Ltd., Johannesburg, by order of Court.

Doornhoek Tin Mines, Ltd., Johannesburg, by order of Court.

Kendal (Middelburg) Coal Co., Ltd., Benoni, voluntary.

Appingendam Tin Mines, Ltd., Johannesburg, voluntary.

Macdonald Estates, Ltd., Johannesburg, voluntary.

Height and Haddow, Ltd., Johannesburg, voluntary.

Barnett's Economic Stores, Ltd., Fordsburg, voluntary.

Silver Hill Silver Mining and Development Co., Ltd., Johannesburg, voluntary.

The Mid Ennerdale Estates, Ltd., Johannesburg, voluntary.

Breyten Estates, Ltd., Germiston, voluntary.

Blue Duck Gold Mines, Ltd., Johannesburg, voluntary.

Kuruman Prospecting Syndicate, Ltd., Johannesburg, voluntary.

Palmer's North Rand Gold Mining Co., Ltd., Johannesburg, by order of Court.

New Refractory Ores, Ltd.

An extraordinary general meeting of shareholders of the above company will be held at the Grand National Hotel, Rissik Street, Johannesburg, on Thursday next, the 18th June, at 8 p.m., for the following purposes:—(1) to elect directors and officers; (2) general business. It is hoped that all shareholders will make an effort to be present.

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Finance, Commerce, and Industries.

Union-Castle Mail Dividend.

The final distribution of 3½ per cent., now announced, making 6½ per cent. on the Ordinary stock of the Union-Castle Mail Steam Packet Company for the whole of 1913, is disappointing, seeing that it compares with 6¾ per cent. per annum for the two preceding years. This issue is held to the extent of £880,000 by the Royal Mail Steam Packet Company, while the balance is in the hands of a few other interests. The reduction of ¼ per cent. in the distribution is, of course, a trifling matter provided that the lower rate of dividend can be maintained for 1914.

*   *   *   *

Union Postal Report.

The report of the Post Office for the year 1913 was issued last week. It gives an interesting table of the increases since Union. This table shows that post offices increased by 317 since Union, telephone call offices 812, telephones in use increased 10,879, telegrams 1,031,975, amount to credit of savings bank depositors £735,141, revenue from telegraphs and telephones increased £153,619, and capital expenditure £937,855. The staff increased by 1,494. The number of telegrams dealt with in 1911 was 5,166,676, against 5,863,899 in 1913. Of these, Press messages accounted for 235,767, totalling 28,571,960 words in 1911, as compared with 306,530 telegrams, totalling 41,197,632 words in 1913. The number of local telephone calls in 1913 was 50,022,000, as against 37,000,000 in 1912.

*   *   *   *

Paper Currency Reform.

The Hon. A. Wilmot writes to the *Cape Times*:—The Transvaal Bank Act (No. 2 of 1893), under which notes issued by the National Bank of the Transvaal were exempted from the provisions of the Act (section 18), contained absurd restrictive rules in it. All the Provinces are now united under the Government of the Union of South Africa, and it is really necessary in public interests that both Ministers and members of Parliament should so study currency questions as to enable them to frame a measure which, while doing justice to banking institutions, will provide adequately for the rights of the taxpayer. They can do this by (1) establishing a Government paper currency, or (2) by providing that a first lien on all bank assets shall be the security for banknote issues, and that an adequate percentage be paid to the taxpayer by the banks. Besides the first lien security the law on the subject adopted in the United Kingdom ought to be applied here, namely: "That a banking company claiming to issue notes is not entitled in that respect to limited liability, but continues subject to unlimited liability in respect to such issue" (Grant's treatise on the law relating to bankers). In this case, as in that of first lien, there is no loss of revenue whatever to the banks, as there is in the case of the absolutely unnecessary requirement of lodging Government stock against note issues. A study of currency legislation in Europe and of recent important developments in the United States is desirable. Of course, the Government note issue is based on the sound policy of convertibility on presentation; it can be made the means of putting one pound notes into circulation. Taking, for example, the circulation at three million pounds sterling, and keeping one million in the Treasury as a gold reserve, the Government would possess a loan from the people, for the people, of two million pounds sterling not bearing any interest, besides the value of each note destroyed or lost would go into the pockets of the taxpayers and not into those of shareholders in joint stock banks. The Bank Act of 1891 (Cape Colony) and the Transvaal Act (No. 2 of 1893) should be repealed as soon as possible. One general comprehensive Act for the Union of South Africa substituted, and upon the study of currency laws laid down by the best authorities, and their practical application by all civilised nations.

Cattle Raising as a National Industry.

In the current number (May) of the *Agricultural Magazine* there appears a most interesting and instructive article from the pen of Mr. Alex. Holm, Under-Secretary for Agriculture in the Union, on our progress as an agricultural country, from which we are able to give some valuable figures. After showing that there has been a great reduction in the number of cattle maintained in the chief meat producing countries of the world for the meat eating countries of the world, he states that, at the present time, there has been a great increase in population; for instance, in Germany the increase has been from 56,567,000 in 1900 to 64,926,000 in 1912. The United States, who has been a large exporter of beef, is now fast approaching the stage when she will be able to support in this respect her own population only. Canada is likely to be an importer in the near future. Germany imported meat to the value of £1,253,000 in 1907, in 1912 this rose to £3,533,000, or an increase of nearly 200 per cent. in six years. The Argentine is the only country which stands out as being in a position to supply beef to the densely populated countries of Europe. What are the lessons to be derived, the conclusion to be drawn, and the importance of these figures and facts to the cattle breeders in South Africa? asks Mr. Holm. The world's supply of beef is decreasing in proportion to the population, and beef is consequently rising in price. In South Africa and in Rhodesia there are large tracts of country suitable for cattle raising. Diseases which have in the past decades decimated the herds of South Africa are now, with few exceptions, well understood, and are either being eradicated or controlled. The cattle breeder of to-day is not menaced with the same risks which formerly prevailed, and cattle breeding under good management can be pursued with success and profit. The census of cattle in South Africa gives the following figures:—Union of South Africa, 5,797,000 in 1911 and 3,500,000 in 1904, or an increase of 65 per cent. over a period of seven years. In the Cape the increase was 39 per cent.; in Natal there was a decrease of 31 per cent., due to the ravages of East Coast Fever, now stayed; in the Transvaal the increase was 160 per cent., and in the Free State it was no less than 254 per cent. Pricing the cattle of the country at an average of £6 per head (all ages) the figure of £31,782,000 is arrived at as the value of cattle within the Union of South Africa. As indicating the progress of cattle and sheep breeding in South Africa during the last few years statistics of the imports are quoted. In 1903, apart from imports into the O.F.S., of which figures were not obtainable, beef to the value of £1,910,000, and mutton to the value of £950,000, or nearly £3,000,000, was imported. In 1906 the imports were reduced to: beef, £511,700; mutton, £245,300; a total of £757,000. In 1913, beef £80,500, and mutton £24,500, a total of £105,000. In the dairy industry the drop is also marked. In 1913 we imported butter and cheese to the value of £1,122,000; in 1906 it dropped to £691,000, and in 1913 to £356,000. That both these amounts for imports will be wiped off in the near future is nearly certain; and there is every reason to consider that not only shall we be able to supply the needs of an ever-increasing population from within the Union, but that we shall have a surplus for export oversea. Thus our entry into the category of meat producing countries in the markets of the world is only a matter of time, and on our present rate of progress, but a short time.

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THE WEEK IN THE SHAREMARKET.

Brighter Prospects—Political Fears—Ending Easier.

THE excellent May output and the speech made by the Chairman at the Rand Mines meeting had a strengthening effect on the market. Towards the close of the week, however, business fell off on the Union Government crisis and the political troubles in the United Kingdom. Features of the week were State Mines, which saw considerable activity, and New Kleinfonteins, which were very largely dealt in on Thursday. Modder Deeps, Van Ryn Deeps, and Consolidated Langlaagtes continue in good demand. Mr. Schumacher's very businesslike address at the Rand Mines meeting forms a striking record of the real hard work done during the year to strengthen the position of the mines. It remains to be seen how the Union Government will act in the present crisis. Had the trouble not occurred at this juncture, doubtless the dividends would have produced a more marked effect.

	Fri. 5th.	Sat. 6th.	Mon. 8th.	Tues. 9th.	Wed. 10th.	Thur 11th.
Adair Ushers	—	0 5*	0 5*	0 5*	—	0 5*
African Farms	11 0†	10 6*	10 6*	11 0	11 3	11 0*
Apex Mines	—	13 0†	—	16 0*	17 0	17 9
Aurora Wests	—	—	—	8 9*	—	8 9*
Bantjes Cons.	—	—	—	12 6*	13 0*	—
Blaauwbosches	—	—	80 0*	82 6*	83 0*	—
Brakpan Mines	42 0*	42 9	—	42 0*	43 6*	44 0†
Breyten Collieries	26 0*	26 0*	26 0*	26 0*	26 0*	26 0*
Bushveld Tins	—	0 6*	0 8	0 6*	0 6*	0 6*
Cinderella Cons.	—	5 3*	5 3*	—	—	5 3*
City and Subs.	49 3*	49 0*	49 6*	49 6*	49 9*	49 9*
City Deeps	64 0*	64 3*	64 0*	64 0*	65 6*	65 6
Cloverfield Mines	4 0*	4 1*	4 1*	4 2*	4 3	4 3
Con. Investments	—	20 0†	—	—	—	—
Con. Langlaagtes	33 3*	33 6*	34 0*	34 0*	34 6	34 0*
Con. Main Reefs	17 6	17 6	17 3	17 5*	17 6*	17 6*
Con. Mines Selection	—	—	7 3*	—	—	7 0*
Coronation Colls.	—	19 0*	19 0*	19 0*	19 0*	19 0*
Crown Diamonds	—	4 6†	—	3 6*	2 6*	3 0*
Durban Rood. Deeps.	17 6*	18 0	17 6*	18 6	18 6†	17 6*
East Rand Centrals	1 9*	1 9*	—	1 9*	1 9*	1 9*
East Rand Coals	1 7*	1 7*	1 8*	1 7*	1 7*	1 7*
East Rand Deeps	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
E.R. Minings	—	2 6*	—	—	—	2 6*
East Rand Props.	31 0*	31 0*	31 0*	31 0*	33 0*	33 6*
East Rand Debs	—	—	£88*	—	£88*	£88*
Eastern Golds	1 0*	1 0*	1 0*	1 0*	1 0*	1 0*
Frank Smiths	2 6*	2 6*	—	2 0*	2 6	2 6*
Geduld Props.	23 0*	23 0*	22 6*	23 3*	23 9*	24 6*
Geldenhuis Deeps	—	—	—	22 6*	—	22 6*
Glencairns	—	—	—	—	—	6 0*
Glencoe Collieries	—	6 6	6 3*	—	—	—
Glynn's Lydenburgs	10 0*	10 0*	—	10 0*	10 6*	11 0*
Govt. Areas	21 9	23 6	23 9	22 9	22 6	22 3
J'burg Bd. of Ex.	23 9†	23 9†	23 9†	23 9†	23 9†	23 9†
Jumpers	4 0†	—	—	—	—	—
Jupiters	4 0*	4 0*	4 0	—	4 3†	4 3†
Kaalfonteins	0 3*	—	—	0 3*	0 3*	0 3*
Kleinfontein Estates	—	—	—	20 0†	20 0†	20 0†
Klerksdorp Props.	2 6*	2 8	2 7*	2 7	2 8	2 9*
Knight Centrals	7 5*	7 1*	7 0	7 1*	7 3*	7 4*
Knights Deeps	32 0	33 6†	—	33 0	32 6*	32 0*
Lace Props	3 1*	3 0*	3 9*	3 1*	3 1*	3 1*
Lancaster Wests	—	2 6*	—	—	—	—
Langlaagte Estates	—	—	—	19 0*	—	—
Luipaardsvlei Est.	9 6*	9 6*	9 6	9 0*	9 6	9 6*
Lydenburg Farms	2 6*	—	—	2 6*	2 6	2 6*
Main Reef Wests	6 6*	7 0	6 9	6 9	7 0	6 10*
Meyer and Charltons	—	116 6	116 3*	116 3*	116 6	115 0*
Middelvlei Estates	—	1 0*	1 0*	1 0*	1 2*	1 3*
Modder B's	—	—	—	84 6*	86 6*	87 0*
Modder Deeps	52 3	53 0	53 0*	53 6*	55 3	55 6
New Boksburgs	—	0 9*	0 9*	0 10*	1 0*	0 11*
New Eland Diamonds	—	—	30 0†	30 0†	—	—
New Era Cons.	5 9*	5 9*	5 9*	5 9	5 6*	5 6*
New Geduld Deeps	—	—	—	—	1 7*	—
New Gochs	—	—	—	14 9*	14 6*	15 0*
New Heriots	54 0*	54 0*	54 0*	54 0*	54 0*	
New Kleinfonteins	21 6	22 0*	22 0*	23 0	23 0*	23 0*
New Modderfonteins	—	255 0*	255 0*	256 0*	255 0*	257 6*
New Rietfonteins	—	3 0†	—	3 3†	—	3 0†
New Unified	—	—	—	16 6*	16 0*	16 6*
Orange Diamonds	1 1*	1 1*	1 1*	1 1*	1 1*	1 0*
Pigg's Peak	9 9*	—	9 9*	9 9*	9 9*	9 9*
Pretoria Cements	46 0*	46 0*	46 0*	47 0*	46 0*	47 0†
Princess Estates	4 9*	4 9*	4 9*	4 9*	4 9*	5 0*

*Buyers †Sellers

	Fri. 5th.	Sat. 6th.	Mon. 8th.	Tues 9th.	Wed. 10th.	Thur. 11th.
Rand Collieries	—	—	—	—	1 0*	—
Rand Klips	2 4*	2 5	2 4*	2 4*	2 6	2 4*
Rand Nucleus	1 7*	1 7*	1 8*	1 7*	1 7*	1 8*
Randfontein Deeps.	3 5*	3 6*	3 6*	3 6*	3 6*	3 6*
Randfontein Est.	19 6*	—	20 0*	20 0*	20 9*	—
Roberts Victors	15 0*	15 0*	15 0*	15 0*	15 0*	15 0*
Robinson Deeps	—	30 0†	—	—	27 6*	—
Roodebergs	—	21 0*	21 0*	21 0*	21 0*	21 3*
Roodepoort Uniteds	—	3 6*	3 9*	—	4 6*	4 6*
Ryan Nigels	2 9*	2 9*	2 9	2 6*	2 6*	2 7*
Shebas	—	—	4 6*	4 6*	4 6*	4 6*
S.A. Lands	2 5*	2 5*	2 5	2 5*	2 5*	2 6*
Springs Mines	10 0*	10 0*	10 0	10 0*	10 6	10 6
Sub-Nigels	10 3*	10 6*	10 3*	10 3*	10 3*	10 3*
Trans. Coal Trusts	26 9*	27 0*	27 6†	26 9*	27 6*	—
Trans. G.M. Estates.	—	—	36 0*	—	36 6*	—
Van Ryn Deeps	45 6	45 0	44 9	45 0*	45 3*	45 6*
Village Deeps	37 6*	38 0*	38 0*	38 3*	39 0*	39 6
Village Main Reefs	34 0*	35 0*	36 0*	37 0*	37 6*	—
Vogel Con. Deeps	1 0†	1 0†	1 0†	1 0†	1 0†	0 6*
West Rand Cons.	8 3*	8 0*	—	8 0*	8 6*	8 6*
Western Rand Est.	2 6†	2 6†	—	2 6†	2 6†	2 3†
Witbank Collieries.	43 6*	43 6*	43 0*	43 6*	44 0*	44 0*
Witwatersrands	69 0*	69 0*	—	70 0*	71 0*	71 6*
Wit. Deeps.	52 0*	51 6*	51 9*	51 0*	51 6*	51 9*
Wolhuters	13 9*	13 6*	14 0	14 3*	14 6	14 9
Zaaiplaat Tins	24 3*	24 3*	24 3*	23 6*	23 9*	24 6

*Buyers †Sellers

MINING MEN AND MATTERS.

Mr. M. I. Williams-Ellis has left for England by way of Rhodesia and India.

* * * *

Mr. George Nathan, so long associated with the General Mining and Finance Corporation, Ltd., left the Rand this week, having severed his connection with the Corporation.

* * * *

Their many friends will welcome the announcement of the registration of a new company by Messrs. W. F. T. Harvey and Russell, under the name of Harvey & Russell, Ltd. The new company has acquired the agencies for several well-known manufacturers, and these will be relinquished by Messrs. Harvey & Co., Ltd., as from 1st July next. The manufacturers are Messrs. Croft & Perkins, Ltd., Bradford, power transmission machinery; Messrs. Dewrance & Co., London, steam fittings, metals for bearing surfaces; Messrs. R. G. Ross & Son, Ltd., Glasgow, Rigby patent steam hammers. Messrs. Harvey & Russell, Ltd., are also prepared to quote for the supply of any mining or general engineering requirements for import.

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CONTENTS.

PAGE
Notes and News 439

Topics of the Week:

The Bailey Group 441
Improving Underground Hygienic Conditions on the Rand 442
Phthisis and Trickery 442
The Half-Year's Dividends 443
The State-owned Mining Areas 444
The Position of the Welgevonden Tin Mine 445
Recent Progress in Rand Metallurgical Practice 446
Recent Progress of Industrial Hygiene 447
The Year with the Robinson Deep 448
Another Madagascar Oil Fotation 448
Graphite-Coated Diamonds from the Premier Mine ... 449
Prospects of the Leeuwpoort (African Farms) Tin Mines 450
Local Industries and the S.A. National Union 451
Transvaal Chamber of Mines' Monthly Report 452

Rhodesian Section:

Latest Mining News 453
The Rhodesia Museum 453
Mining Men and Matters 455
Engineering Notes and News 457
Producer Gas Engines for the Outside Districts ... 459
The Week in the Sharemarket 461
Finance, Commerce and Industries 462
Company Meetings: African Farms; Leeuwpoort Tins; S.A. Gold Mines; Witwatersrand Township ... ... i.

Notes and News.

Crown Diamonds: Operations Suspended.

The recent decline in the price of diamonds has largely discounted the advantage gained by the Crown Diamond Mining and Exploration Company from its reconstruction and remodelling of the plant in January last year, which led to a reduction in the cost of working. Under the new conditions that obtained, work was commenced in August last, and the prospects were of the best. But the circumstance mentioned, which could not be foreseen, has proved to be a serious obstacle to earning the profits that were anticipated at the time of the improvements in working, and the directors have deemed it advisable to suspend washing operations for the present. Precautions will be continued for keeping the property in a position to resume at short notice. Negotiations are about to take place for the stabilising of the diamond market, and if any improvement in the price of diamonds should follow, the directors will at once consider the advisability of resuming mining operations.

* * * *

Randfontein: Dividends Passed.

The official announcement that the Randfontein group was passing its dividends was not entirely unexpected. The notice says that the Board of Directors of the Randfontein Estates G.M. Co., Witwatersrand, Ltd., and The Randfontein Central G.M. Co., Ltd., regret to inform shareholders that owing to the shortage of native labour, as well as the late strike and present unrest amongst white labour, they deem it inadvisable to declare an interim dividend in respect of the half-year ending June 30, 1914. Owing to the causes mentioned, the profits for the first half of the year, as compared with the corresponding period of last year, have suffered to the extent of nearly £100,000. In these circumstances, the directors consider that by passing the dividend for the half-year the finances of both companies will be placed on a sound basis.

* * * *

S.A.I. of E.E.

At the monthly meeting of the South African Institute of Electrical Engineers on Thursday, Mr. E. A. Wallers (President of the Transvaal Chamber of Mines) presented the gold medals of the Institute to Mr. S. E. T. Ewing for his paper, read in 1912, entitled "Some Practical Aspects of Electric Hoisting," and to Mr. W. Elsdon Dew for his paper, read last year, entitled "Water Power Plants, with special reference to the Belvedere Power Plant, Pilgrims Rest district." In the course of his speech, Mr. Wallers said that what had impressed him about societies like theirs was the enormous educative value of the monthly meetings and the deliberations, both for themselves in rubbing shoulders with one another, and certainly for the industry with which they were concerned. He was keenly interested, as all of them were, in the Safety First movement. Recently he took occasion to make a little investigation as to the number of accidents due to electrical machinery, and it seemed to him that they were to be congratulated, and the men under them, on the few accidents there were, notwithstanding the enormous amount of electrical machinery there was in use, and the miles of cables there were on the Rand.

* * * *

New Kleinfontein New Shares.

As expected, a special general meeting of shareholders in the New Kleinfontein Company, Ltd., has been called for July 21 for the purpose of considering a proposal to increase the nominal capital of the company from £1,151,540 to £1,300,000 by the creation of 148,460 new shares of a nominal value of £1 sterling each, 115,154 of which shares shall be offered to shareholders for subscription *pro rata* to their registered holdings in the company as at the 30th June, 1914, in the ratio of one new share for every ten held, at the price of 20s. in cash per share. The issue has been guaranteed subject to a commission of 5 per cent., payable in fully paid shares of the company. The guarantee contains a stipulation that it is to become void should the making-up price of Rand Mines, Ltd., shares for the end of July account be under £5 5s. The new shares will rank for dividend in like manner with the other shares of the company issued at the respective dates of their allotment, except as regards any dividend which may previous to allotment have been declared. The following directors and shareholders of the New Kleinfontein Company are interested as guarantors or representatives of guarantors in the scheme as stated above:—Messrs. Wm. Dalrymple and Edw. H. Read in their capacities as managing director and manager in South Africa of the Anglo-French Exploration Company, Ltd.; Mr. W. J. Gau in his capacity as representative of Sir George Farrar, Mr. A. G. Gill in his capacity as representative of Messrs. S. Neumann & Co., Mr. J. H. Ryan in his capacity as representative of Sir Abe Bailey; Mr. G. C. Fitzpatrick in his capacity as representative of Mr. Julius Friedlander, Mr. Edward Wagg in his capacity as a member of the London Committee of the company; Sir George Farrar and Messrs. William Ross and H. O'Kelly Webber are interested individually as guarantors. The following cable was sent to the London office of the company on Thursday: "Board of directors have declared an interim dividend of 5 per cent. for the period ending June 30, payable to shareholders registered on June 30. Close transfer registers from July 1 to July 21, both days inclusive. Both offices pay out on or about August 7. At December 31, 1913, after providing for dividend, there was debit balance £73,000, excluding cash assets not immediately realisable of £3,000. At June 30, after providing for dividend now declared, £6,000 capital expenditure, £52,000 for Benoni Consolidated Gold Mines, Ltd., liabilities, amalgamation, adjacent recently bought properties, estimated debit balance will be £77,000, excluding cash assets not immediately realisable £43,000."

*   *   *   *

Mining in North-Western Rhodesia.

North-Western Rhodesia, although it has so far proved more or less disappointing from a mining point of view, is nevertheless a country possessed of considerable mineral-bearing possibilities, more so in regard to base metals and coal than in gold—the staple industry of Southern Rhodesia. At the same time it should not be overlooked that gold has been found at numerous localities, more particularly in the vicinity of Kasempa and the "hook" of the Kafue River. As to base metals, shareholders in the Rhodesia Broken Hill Development Company will doubtless be greatly pleased to hear that there is at last some likelihood of the long-looked-for plant being erected. On the copper belts of the country the King Edward Mine is reported to be working successfully, whilst at the Bwana M'Kubwa property the treatment plant is being extended.

*   *   *   *

Diamond Share Market.

According to London advices, diamond shares have again felt the absence of Paris support, and quotations are barely maintained. The diamond industry continues depressed, both in Amsterdam and Antwerp, where the trade is very sluggish. Of course the demand for the stones for the United States is greatly reduced by the stagnation of business owing to the Mexican trouble. There is just one crumb of comfort for the Continental diamond industry, viz., that the absence of the American demand has helped to end the attempt to establish a diamond cutting experiment in New York, and the workmen who had gone to the States have now returned to Amsterdam.

*   *   *   *

Engineering Initiative at the Turf Mines.

Some interesting engineering work has recently been carried out at the Turf Mines shaft of the Village Deep. It was referred to by Mr. R. W. Schumacher in his speech at the Rand Mines meeting. It seemed likely but a little while ago that the present Whiting hoists at the Turf Mines might have to be replaced at considerable expense by more powerful engines, but owing to the initiative shown by Mr. B. Gray, the resident engineer, who made various important and successful experiments together with Mr. J. H. Rider, the consulting mechanical engineer, it appears that the old engines can be made to do all the work that is required. It has been found that the Whiting hoist, which is now electrically driven, can be run successfully with only one coil of the rope round the reels instead of three coils, as has everywhere been the practice with the Whiting hoist driven by steam. The efficiency of the engine is now, in consequence, very greatly increased.

*   *   *   *

Village Main Reef.

Presiding at the meeting of the Village Main Reef Gold Mining Company, Ltd., last week, Mr. M. A. Braunstein, chairman and managing director, said the result of the Miners' Phthisis Act was eminently satisfactory. The disease had at last been checked, if not removed. He emphasised that the death-rate among whites in Johannesburg compared favourably with the death-rate in London. They paid heavily for these satisfactory health conditions, but they did not begrudge a penny. He announced the first five months of the current year showed a working profit of £150,000.

*   *   *   *

The Case of the Premier Mine.

The *S.A. News* opines that Mr. Jagger's amendment stands in need of being itself amended if it is to stand at all, and that if "the additional burden" which the *News* conceives it to represent is thrown on the Premier Mine, "then every consideration of justice and equity demands that it must be shared by De Beers and the gold mines." The *Diamond Fields Advertiser* rightly points out that far from there being any "additional burden" on the Premier, there was not, up to the time of Mr. Jagger's proposal, any burden at all, in the shape of contribution by way of taxation to the revenues of the State. Hence the considerations of justice and equity to which the *News* appeals point, as a matter of fact, entirely the other way. De Beers and the gold mines already pay the profits tax. The Premier does not. To call upon De Beers and the gold mines to pay both profits tax and income tax would undoubtedly be to impose an "additional burden," for which there would be no justification whatever. To exempt the Premier from paying income tax, seeing that it was already exempted from paying the profits tax, was to pereptuate a privileged position for which in equity no excuse exists. The *News* is presumably obsessed by the Government's 60 per cent. That, as previously explained, is the outcome of a partnership, and in no sense a tax. The partnership arrangement was a compromise, come to by virtue of legal enactment in accordance with the existing principles of the Transvaal law, under which a proportional interest in any such undertaking belonged from the outset to the public. The Premier Company was floated on that basis, and received under the partnership a greater advantage than it would have done under the law previously in force in the Transvaal. Under these circumstances, and as the *Cape Times* points out, there is no more reason why the Premier should be exempted from contribution to the revenue than any other mining concern. On the other hand, there is every reason why those companies which already contribute should not be called upon to do so over again. Mr. Jagger's proposal therefore meets the case, and no further amendment is required.

*   *   *   *

The Harrisdale Properties.

The Harrisdale Syndicate continues its activities both on the tin properties in the Waterberg and the diamondiferous venture in Barkly West District, whilst the enterprising directors have just lately further extended the scope of the syndicate's activities by acquiring a farm in the vicinity of the well-known Eland Diamonds property. First of all as to the tin properties, writing under date May 30th, 1914, Dr. Mezensky reported of Tamsen's portion of Welgevonden No. 1772:—Since the date of my report on the above, viz., the 13th May, 1913, a vertical shaft has been sunk to a depth of 45 feet on the vertical fissures in the centre of the incline shaft. Mr. Dismore has sampled the shaft at this point, showing an assay 3·2 per cent. of metallic tin over a width of 10 feet. This result must be considered as very satisfactory. I recommend now to carry the vertical shaft down to 100 feet and then drive on the fissure. From this point also a crosscut should be put in north to intersect the fissures occurring about 20 feet away. Development results at No. 1 shaft have been given us as follows:—Near the surface over eight feet in two sections of 4 ft. each; 3·22 per cent. metallic tin over 4 ft., and 1 per cent. over 4 ft. At 45 ft. over 10 ft. in one sample; 3·2 per cent. of metallic tin. At 50 ft. in two sections of 4 ft. each; 5·6 per cent. metallic tin over 4 ft. and 8 per cent. over 4 ft. The richer portion of the lode is at the northern end of the shaft and the ore body is not fully exposed. A crosscut is being put in north to ascertain the full width. The latest work in sinking No. 1 shaft on Tamsen's portion has disclosed the following values in the shaft:—At a depth of 55 ft. over 6 ft. 6·8 metallic tin. At some distance to the east and in another shaft over 3 ft. 6 in. 1·8 per cent. At Rietfontein 1638, a lode has been located in granite area. Initial development has disclosed a width of 2½ to 3 ft. with pannings giving 10 to 20 per cent. metallic tin. Assays are now being made. On the Harrisdale property alluvial ground is being washed under the superintendence of Mr. Frank Rivas. It is intended to use one or more Cox gravitating machines as soon as these are manufactured. One of these Cox machines has recently been tested at the National Diamond Mine treating concentrates, blue ground and alluvial. The results are stated to be an unqualified success.

* * * *

A New Diamond Mining Method.

The Harrisdale Company has acquired rights over the farm Zoet-en-Zuur, adjoining the Eland Diamonds property. The "Elands" fissure runs through the farm, and in several places a width of 2 ft. 6 in. to 3 ft. 6 in. of fissure has been located. As the walls are treacherous, a novel method of working (novel in so far as diamond mining is concerned) has been decided on. Shafts will be sunk and a connecting drive carried in. A system of overhead stoping will then be carried out, and the worked-out ground filled in with sand from the surface. By this means a clean product of yellow ground should be obtained, and it is expected to mine and treat ground at a cost of 5s. per load. The yield is expected to work out at 10 carats per 100 loads, the diamonds being worth 30s. to 35s. per carat. This gives a value of 14s. per load. The fissure has been located for a distance of over a mile in length.

* * * *

Messina Smelting Policy Criticised.

American metallurgists appear to be much interested in the smelting policy now being pursued at the Messina Copper Mine in the extreme Northern Transvaal, and they remark on the conservatism exhibited by the company in building two short-hearthed reverberatory furnaces. Herbert Lang, in the issue of the *Mining and Scientific Press* to hand by this mail, writes:—

> The directors of the Messina property seem to have approached the metallurgical subject with extraordinary timidity, considering the apparently favourable conditions surrounding their undertaking. Some British companies seem to enjoy working out the details from the beginning of a process, as if they were the first in the field, preferring to ignore the results and practice achieved by previous workers. Contrary to the general impression among metallurgists that the initial steps in the introduction of a smelting or other process are painful, some of our friends across the water appear to revel in the trying and fitting stage, possibly under the impression that the ground was never trodden before. American metallurgists, and no doubt many foreign ones also, will smile at the installation of "a pair of 23ft. reverberatories," and more broadly at the production of a 50% matte in one operation, leaving 1.5% copper in the slag. But what will they say to shipping a 10% concentrate out from the heart of Africa, along with the aforesaid matte? And by what sort of legerdemain do the Messina metallurgists achieve "10 to 15% jig middlings"?

TOPICS OF THE WEEK.

THE BAILEY GROUP.

Despite the drought and the drop in the price of tin—two depressing factors that particularly affected them—the companies of the Bailey group made a very satisfactory showing this week. Mr. Julius Jeppe explained the position in detail at the annual meetings, and full reports of his lengthy and interesting speeches will be found in this issue. The fact that, in deference to oversea shareholders, the meetings are now held so late in the year enabled Mr. Jeppe to supplement the annual reports with particulars of progress in the last five months. Moreover, on the newly-arisen questions of Labour taxation on town site values and the Government land tax, he made noteworthy pronouncements. Discussing the Labour Party's Bill to remove the local taxation from buildings to the land, Mr. Julius Jeppe, at the annual meeting of the Witwatersrand Township Estate Company, made the following noteworthy statement:—"The Government, in reserving the Ordinance, has shown much more wisdom and forethought for the best interests of the country than did the precarious, predatory, and presumptuous majority of one of the Labour Party. I think the shareholders may have every confidence that the Union Government will ultimately deal with this measure in a way which will prove its desire to be fair and just to all sections of the community; and that it will not, therefore receive the assent of the Government. And I also feel sure that such a policy will not receive the permanent support of the electorate, and when this fortuitously-gathered majority of one has, in the course of time, to return to its alarmed constituents, I am more than sanguine that, as in the past, so in the future, the innate sense of justice and commonsense of the people will be more than a match for the wiles and machinations of syndicalist orators." Mr. Jeppe's speech at the African Farms meeting included an eloquent and reasoned review of the agricultural potentialities of the country, which merits careful perusal. Mr. Emrys Evans, in supporting him, likewise gave proof of his confidence in the great future of the land. Turning to General Smuts' strictures on the land companies, Mr. Jeppe showed that the company had already developed 56 per cent. of its farms—and he challenged the Government to show as good a record. The tin interests of African Farms now bulk largely in the base metal industry of South Africa. At Welgevonden operations are to be suspended till the water supply and the price of tin are more satisfactory. In regard to Leeuwpoort Mr. Jeppe drew particular attention to the undoubted permanency of the lodes and their tin values. At the end of last year the main shaft in the principal mine was down 652 feet; since then, 108 feet have been added, and at the present depth—namely, 760 feet—the lode gives tin values of 3·1 per cent. over 12 inches. "You may therefore be quite sure," he said, "that you possess in Leeuwpoort a property of very great intrinsic value and undoubted stability, and that it can only be a question (as it naturally has been and always will be) of the price of the metal, and, as I indicated just now, the anticipation of a speedy rise in the tin market seems warranted; in the meantime, we must be satisfied with the knowledge that even at to-day's price of tin the Leeuwpoort Company is making a profit." In closing his review of African Farms and its varied interests, Mr. Jeppe said:—"Although we have met with some disappointments during the year, we have every reason to congratulate ourselves on the position of our company, which is undoubtedly a sound and strong one, with great potentialities"—a conclusion with which no one who studies the progress of its many-sided activities can fail to agree. In the course of his review of the position of the South African Gold Mines, Mr. Jeppe was able to show that the intrinsic value of the assets of that undertaking was much higher, and nearly all, if not all, of them held out excellent prospects for the future. Although during the year under review some dividend-paying shares had been sold for the purpose of paying off liabilities, Mr. Jeppe said:—"As far as I can judge to-day, unless we dispose of any more dividend-paying shares, the amount we will receive during this year for dividends will be equal to that we have received during the year under review. From this you will gather that not alone have we paid off all liabilities, except as already mentioned the balance of debenture debt, but we have shaken out all our bad and doubtful stuff, and I have no hesitation in saying that there can be no recurrence of heavy losses by depreciation, from which we have suffered so severely during past years." Given a reasonable rainfall for the coming season, a recovery—now evident—in the price of tin, and freedom from harassing, Socialistic legislation, the prospects for the companies of the Bailey group are bound materially to brighten in the next year.

IMPROVING HYGIENIC CONDITIONS UNDERGROUND ON THE RAND.

The most important aspect of the report of the Select Committee on the working of the Miners' Phthisis Act is that reflecting the progress of the disease and the means which are being adopted towards its prevention. The Blue-Book published this week shows that the Select Committee was at considerable pains to find out the facts, and no witness was allowed to conclude his evidence without expressing an opinion on the subject. With the testimony available of such well-informed witnesses as Mr Kotze, Dr. Van Niekerk, the Medical Inspector of Mines, and Drs. Watt and Irvine, the Select Committee was, of course, in a unique position to pursue its inquiries. The net conclusion of the Select Committee on the subject, as embodied in the report noticed last week, is, of course, eminently satisfactory, and cannot be over-emphasised. That conclusion, it will be remembered, was that while the figures supplied by the Phthisis Prevention Board did not indicate any diminution, since the commencement of the Act, in the number of applications for compensation, the evidence of the members of the Medical Advisory Committee was more reassuring. The majority of the witnesses were agreed that we were still suffering from the accumulation of cases of the disease contracted during the time when little was done on the mines towards its prevention; and that the time which had elapsed since strenuous steps were adopted towards that end was too short to make itself sensibly felt in the statistics. The Committee noted with great satisfaction that the officials of the Mines Department, of the Chamber of Mines, of the men, and of the Medical Advisory Committee were unanimous in their testimony regarding the marked improvement which had been effected in underground conditions, both in respect to dust prevention and ventilation, and in regard to the hearty and much to be desired co-operation of officials and men in bettering conditions; and hoped that the effect of these beneficial efforts would in the immediate future be reflected in a great diminution of the incidence of the disease. An examination of the evidence shows that the Select Committee was amply justified in drawing these conclusions. Mr Kotze, the Government Mining Engineer, it is true, was not quite so dogmatic as he had been before the Select Committee on White Labour on a previous occasion. He expressed some doubts about the complete efficacy of the mere reduction of the proportion of dust to five milligrammes per cubic metre. Questioned more closely by the Chairman, however, he added: "I think we have made a great advance. I wish to remove any wrong impression on that point. I think the advance made in the last two years is enormous. I wanted to indicate that doubt (there is a scientific doubt which one must bear in one's mind), but I do think our conditions have improved enormously and a man should not get phthisis easily if he takes advantage of all the present precautions at his command." To Mr [illegible], who asked: "You now want to qualify what you said about a year ago to the Chamber of Mines?" Mr. Kotze replied: "I was a little bit more positive then than I am now. This doubt has arisen in my mind in the course of the last twelve months." Dr. J. S. van Niekerk, the Medical Inspector of Mines, apparently does not share Mr. Kotze's philosophic doubt. Asked if he had formed any opinion as to whether the disease was diminishing or increasing, he replied very emphatically: "I have said that the number of applications have, on occasion, increased at certain times when people are in want of money. But judging from the conditions on the mines I am certain the disease must be decreasing. I also judge that from the kind of applications which are coming in. For instance, in the first year we were getting all B cases, and only a few in A. Now we are getting hardly any B cases, and it shows that at first we had a big stock to work on—the accumulation of years, and moreover, bad cases. At the present time they are only A cases, and in view of that fact, the device of the £200 is also a good one. That is one point. The second point is the condition of affairs on the mines. At present they are analysing the air all over the mines, and the work is nearly done all over the Witwatersrand. It is surprising to see the small amount of dust at present in the mines—almost as little as there is in the streets. Judging from that also I think the disease is running down. I am never optimistic, but I do think that in some years we shall be finished with miners' phthisis." Another unbiassed witness, a practical miner named Mr. S. C. Watson, added his testimony to the same effect. We quote from his evidence:—

> You think the mines have very much improved?—Very much.
>
> Since 1910?—No, since I have gone back to work.
>
> When did the improvement take place; during the last four years?—Within 15 months. After I came back I found a great improvement as compared with 18 months ago.
>
> What is the nature of the improvement?—The use of water and the prevention of dust. There is water everywhere.
>
> How is the ventilation?—It is greatly improved.

All this goes to show that the Select Committee had ample testimony from other than the Chamber of Mines and the Mine Managers regarding "the marked improvement that had been effected in underground conditions" on the Rand.

PHTHISIS AND TRICKERY.

The report of the Select Committee on the working of the Phthisis Act is disappointingly silent in regard to the all-important question of safeguarding the operations of the Phthisis Board from fraud and trickery. The subject is not new to our readers, as we recently set out very fully the disadvantages of the present system and the facilities which its methods of secrecy and decentralisation afforded to fraud. Since we wrote two things have happened: the evidence given before the Select Committee has amply confirmed our views, and, according to the daily Press, some flagrant cases of fraud on the Board have come to light. In other words, our fears are being realized, and there is reason to believe that an organized, wholesale, attempt is being made to obtain miners' phthisis compensation for those who are not entitled to it. In "The Star" of Wednesday last some grave allegations were made, and there was a reference to a particularly glaring case of impersonation that has lately been common talk in mining circles. Doubtless full inquiry will be held, and all the departments concerned put on their guard against a repetition of such occurrences. The point is, however, that no effective check can be instituted in the absence of the desired precautionary measures recently described in these columns. The first of these reforms, which we advocated, was described in detail, we notice, by Mr. R. A. Barry before the Select Committee. He advised that there should be a list of beneficiaries accessible to the mine managers, showing who is getting compensation, and giving all details about each case. Further, Mr. Barry said: "We maintain that in order to lessen mistakes there should be an Advisory Board of medical practitioners, and all cases should finally go through the hands of such Advisory Board. That is to say, employ a Board of say three experts, whole-time men who are really expert in the use of the X-rays and who are really studying the disease and following it up. Those men would have all the statistics available and would be able to go about the work in the closest and most businesslike way. They would also have the best appliances and the best means of thoroughly following up the matter. Many of the doctors on the general Board are very busy men, with very large practices, and they do not, I understand, pretend to be expert in every line of their profession. They cannot be." Mr. Barry quoted a number of cases where the present system had proved itself to be glaringly at fault. It is to be hoped that these, coupled with the fact of their recent multiplication, will arouse the Government to a tardy recognition of the need for reform in the interests alike of mines and men.

THE HALF YEAR'S DIVIDENDS.

The Shareholder's Harvest—Declarations to Date.

We given hereunder a list of the dividends declared for the half year received up to the time of going to press. The list deals with Rand gold mining companies only, and of course a number of other important declarations are anticipated. In our next issue will be contained our usual half-yearly list in complete form, setting forth not only dividends announced by Rand gold mines, but also by gold mines in the outlying districts and coal and base metal companies, etc.

Company.	Issued Capital.	Date of Declaration.	Rate per cent.	Rate per Share.	Amount.	Total Distribution for Year to Date.	Amount Half Year, June, 1913.	Amount Half Year, Dec., 1913.
THE RAND.								
Central Mining and Investment Corporation.								
Bantjes Consolidated ...	£502,306	June	2½	6d.	£12,557	£12,557	£25,115	£12,557
City Deep	1,250,000	June	11¼	2s. 3d.	140,625	140,625	125,000	93,750
Crown Mines	940,106	June	55	5s. 6d.	517,058	517,058	517,058	517,058
Durban Roodepoort Deep..	440,000	June	3¾	9d.	16,500	16,500	22,000	—
Ferreira Deep	980,000	March	25	5s.	245,000	245,000	245,000	245,000
Geldenhuis Deep	585,753	June	8¾	1s. 9d.	51,253	51,253	58,575	43,932
New Modder	1,400,000	June	15	12s.	210,000	210,000	210,000	210,000
Nourse Mines	827,821	June	8¾	1s. 9d.	72,434	72,434	68,985	82,782
Modderfontein B.	700,000	June	25	5s.	175,000	175,000	140,000	175,000
Robinson	2,750,000	June	9	9s.	247,500	247,500	220,000	192,500
Rose Deep	700,000	June	20	4s.	140,000	140,000	175,000	122,500
Village Deep	1,060,671	June	10	2s.	106,067	106,067	106,067	53,033
Village Main Reef	472,000	June	35	7s.	165,200	165,200	165,200	165,200
S. Neumann & Co.								
Consolidated Main Reef ...	924,364	June	5	1s.	46,218	46,218	46,218	46,218
Wit. Deep	550,000	June	15	3s.	82,500	82,500	82,500	110,000
Wolhuter	860,000	April	6¼	1s. 3d.	53,750	53,750	53,750	32,500
Anglo-French Exploration.								
New Kleinfontein	1,051,510	June	5	1s.	52,727	52,727	—	72,750
General Mining and Finance Corporation.								
Meyer and Charlton	200,000	June	35	7s.	70,000	70,000	60,000	80,000
Van Ryn	500,000	June	22½	4s. 6d.	112,500	112,500	125,000	112,500
Consolidated Mines Selection.								
Brakpan Mines	750,000	June	12½	2s. 6d.	93,750	93,750	150,000	93,750
Robinson Group.								
Langlaagte Estate	886,500	June	5	1s.	44,325	44,325	66,187	22,162

The E.R.P.M.

Issue of the report of the East Rand Proprietary Mines for the first quarter of the year enables us to present some important facts and figures supplementary to the article contained in our last number on the affairs of that company. Thus the report shows that the development for the three months amounted to 10,965 feet and the footage sampled 8,374, the average reef channel being 27 inches and the average assay value over the reef channel width 10·3 dwts. The approximate financial position of the company at the end of the quarter, after providing for all liabilities, but exclusive of the debenture issue of £1,348,230, was £268,302 7s. 7d.; less cash assets (stores and materials, sundry debtors, payments in advance, etc.), £113,638 14s. 1d.; balance (approximate cash position), £154,663 13s. 6d. The profit for the quarter was increased to £160,818 4s. 2d. by the addition of £18,712 9s. 2d., being profit derived from the treatment of 21,790 tons of accumulations. The expenditure on authorised votes for the quarter was £19,944 3s. 9d. The actual expenditure on development amounted to £43,865 8s. 9d., as against £57,840 provided in the working costs (at 3s. per ton milled), leaving a balance of £13,974 11s. 3d., which, added to the balance at December 31, 1913, of £228,212 15s. 5d., gives a total of £242,187 6s. 8d. standing to the credit of development suspense account at March 31, 1914. This amount has been treated as a liability, and is allowed for accordingly.

Cape Asbestos Co.

The annual meeting of the Cape Asbestos Company, Ltd., was held in London in mail week. Mr. L. Breitmeyer presided, and moved the adoption of the report for 1913. He said that, in spite of keen competition, the profits had risen from £16,020 in 1912 to £22,125 last year, while the expenditure had been £7,614, against £5,983 in 1912. The report was adopted.

Leydsdorp Mica.

At an extraordinary general meeting of Leydsdorp Mica, Ltd., held in London in mail week, Mr. John Richardson presiding, a resolution was unanimously approved providing that the capital of the company be increased from £60,000 to £66,000 by the creation of 6,000 new ordinary shares of £1 each, such shares to rank *pari passu* with the shares of the original capital.

Swaziland Tin.

The following are the particulars in regard to this company's operations for the month of April, 1914:—Concentrates recovered, 36·110 long tons; estimated profit (taking the price of tin at £149 per ton), £521. The plant at Gray's Creek was shut down for the whole of the month, owing to damage caused by lightning.

THE STATE-OWNED MINING AREAS.

A List of the Areas on Proclaimed Farms—Importance of the Mooifontein—Vierfontein Lease—The Problem of Finding Capital—The Government Understood to be Awaiting Suggestions—A Field of Illimitable Potentiality.

THE large mining areas on the Further East Rand, disposal of which rests with the Government, have recently had a considerable measure of attention bestowed on them. There has, in fact, been a renewal of interest in this vast State-owned annexe of the Witwatersrand, which bulked largely in the near horizon of Transvaal mining a year or two ago, when the initial development of the Modderfontein property had been advanced to a satisfactory stage and when the Government offered two other areas, namely, the Brakpan-Schapenrust and Witpoort leases, to the tender mercies of capital. The apathy on the part of capital in regard to these areas is now very common knowledge, but before discussing the reef-bearing areas which are at the disposal of the State, the potentialities of these areas and the circumstances which have led up to a revival of interest in them, it may be well to briefly cover a little ancient history so as to more or less accurately define the present position of the State mining leases.

THE RAND'S FIRST STATE MINE.

In the first place it may be recalled that in the last Gold Law a scheme for exploitation of areas under a system of Government leases was added to the method of individual pegging. The first area for which tenders were called was tendered for by various parties and eventually secured by the Barnato group upon terms which the Government themselves afterwards tacitly admitted to be rather too good to be renewed in any subsequent enterprise of a similar kind. This area rejoices in the clumsy title of the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., and it will commence crushing in the course of the next few months. The company was registered early in 1910 with a capital of £1,400,000 and secured the exclusive right to mine the precious metals upon 2,633 claims of the farm Modderfontein No. 167, in the mining district of Boksburg. The consideration payable to the Government for cession of the claims was a sliding scale tax on profits. Following is a summary of the outstanding features of the agreement signed by the Government and the Johannesburg Consolidated Investment Company:—Under the conditions of lease the company shall pay to the Government (a) a tax on the annual net produce obtained from the working of the said claims calculated in accordance with the sliding-scale referred to hereafter; and (b) an additional tax as below. Such net produce shall be taken to be the value of the precious metals produced after deduction therefrom of the cost of production and of such sums as may be allowed in respect of the exhaustion of capital. The sliding-scale before mentioned shall be such that under it the tax payable to the Government shall bear the same ratio to the net produce as the latter bears to the value of the precious metals produced; provided, however, that in no case shall the tax payable to the Government under such sliding-scale be less than 10 per cent. or more than 50 per cent. of such net produce. The additional tax referred to above shall be such that whatever amount may be payable to the Government in accordance with the sliding scale, the lessee shall pay to the Government a further amount computed as follows:—(a) Seven and a half per cent. of the tax payable under the sliding scale, if such tax does not exceed 20 per cent. of the net produce; (b) 10 per cent. if such tax exceeds 20 per cent. but does not exceed 30 per cent.; (c) 17½ per cent. if such tax exceeds 30 per cent. but does not exceed 40 per cent.; (d) 22½ per cent. if such tax exceeds 40 per cent. of the net produce. No tax is payable under the Profits Tax (Gold Mines) Proclamation, 1902. On the termination of the lease by the exhaustion of the precious metals, the Government shall be entitled to 10 per cent. of the net proceeds derived from the disposal of or of the value of the residual plant, buildings, and equipment of the company.

THE BRAKPAN AND WITPOORT LEASES.

The terms of this lease were modified in the case of the Brakpan area, but although applications were called for as far back as the middle of October, 1912, no response was made to an invitation which the Government doubtless thought to be sufficiently alluring. The time limit for tenders was originally put at the 28th day of February, 1913, but since no tender was received by that date, presumably, a second notice was issued on the 8th March, which stated that the time limit had been extended to the 30th June, 1913, and allowed it to be understood that a less stringent attitude would be taken up by the Treasury in the event of the guaranteed capital not being provided within a specified time, and that the question of the Government share of the profits would be susceptible of discussion as to the manner in which it might be paid. These revised conditions, however, did not seemingly appeal to capital; at any rate, they brought forward no response. Only a few days before the modified Brakpan proposals were placed before the public, applications were invited for tenders in connection with the proposed lease of 1,180 claims on the adjacent farm Witpoort. Here, in spite of the depressing example of the previous failure, and at a time when the unsuitability of the terms of the Brakpan-Schapenrust lease must have been engaging the profound attention of the Minister of Mines, an exactly similar set of proposals were made for the Witpoort scheme. The latter is, of course, a smaller undertaking, in which less working capital, and a much smaller guarantee are involved, but, *pro rata*, the objections to the old Brakpan-Schapenrust terms are, presumably, as real in one case as they are in the other.

INTEREST REVIVED.

After the failure of these schemes the subject of the Government Mining Leases sank into oblivion, until a few months ago, when the evidence tendered to the Economic and Dominions Royal Commissions by the Chamber of Mines, the Government Mining Engineer, and other important personages, on the life of the Rand and sections of the Rand which offered scope for expansion of mining operations, again tended to direct attention to the 86,000 or more claims on the Far East Rand, which are mainly what the Rand has to look to when the existing mines are exhausted, and of which about nine-tenths are vested in the Government. As a matter of fact the amount of ground, the mining rights of which are owned by the State, is more than 86,000 claims. Indeed, the total area of ground of this nature which is presumptively reef-bearing, may pretty safely be placed at not less than 90,000 claims. It is difficult properly to realise the enormous industrial potentiality of such a vast quantity of ground, but it may in some measure be brought home to one by the statement that this area represents in point of extent 80 mines each as large as the City Deep. Of course, the reef conditions existent in these claims are more or less unknown quantities. The trend of the banket formation to the east and south of the most easterly mines operating on the Rand to-day is not properly understood, and of course the value per ton of the ore content of this section is even more debatable. But judging from experience in adjacent sections it is not unreasonable to anticipate that a very considerable proportion of this ground will eventually be worked at a profit. As the years go by science and the readjustment of ordinary economics will cause ore which is not profitable to-day to become dividend-earning, and it is even at the present time virtually assured that practically all the ground contained within the 90,000 claims aforesaid lies at a workable depth. Assume, however, that only one-half of this ground may be considered as profitable to work. This means that in the unexploited Rand there still remain forty City Deeps, which should be capable of maintaining the present rate of the Rand's output. If this be recognised then it should be realised without great difficulty that the pessimistic feeling largely induced by the Chamber of Mines evidence to the Economic Commission is susceptible of very material change.

The Problem of Capital.

But how to secure the capital requisite for the exploitation of this enormous annexe, this second edition of the Witwatersrand—that is the problem. The potential value to the State of these Government-owned areas is obviously enormous; no other Government in the world possesses such a vast and valuable asset of State-owned semi-proved mineral wealth. Mr. Kotze, the Government Mining Engineer, thinks that about 50 millions sterling will be required for the development of these areas. Mr. E. J. Way puts the figure much higher at £86,000,000. If a mean between these two figures is adopted, then an estimate of £68,000,000 is arrived at. Means of raising such a vast sum—not all at once, of course, but by degrees according to the active growth of the mines here discussed—naturally calls for consideration. The fact that the offer of the Brakpan and Witpoort leases failed to attract capital must not be lost sight of. In several recent articles we have dwelt on the necessity for the Government seriously to consider ways and means of encouraging capital to become interested in the Further East Rand annexe. Mr. Schumacher, at the Cornish banquet, advocated a scheme whereby small investors would provide funds for the development of at least some of the more promising areas. We believe that at present some scheme is under consideration in the Cabinet and high official circles for a renewal of effort to attract capital and interest in the Government leases. At this juncture we would throw out the suggestion that if the terms offered by the Government are unsatisfactory to capital, capital should give the State some definite idea of what conditions would be deemed sufficiently attractive to constitute a basis for future negotiations. We believe that the Government considers a total taxation amounting to about 30 per cent. of the gross profits by no means unreasonable for ground so favourably situated as the Government Areas on Modderfontein. This means a 20 per cent. taxation over and above the ordinary 10 per cent. profits tax, and we believe that the view adopted by the Government experts is that a reduction of profit by a further 20 per cent. constitutes no unreasonable demand for cession of mining rights over areas known to contain at a workable depth the auriferous conglomerates of the Main Reef series, which are by far and away the most productive and profitable gold-bearing ores in the world. Of course, on the other side, the locking up of several hundreds of thousands of pounds in each lease for a number of years and the uncertainties inevitably attending mining are brought forward as formidable obstacles to any scheme of exploitation in which the terms offered are not most liberal. At any rate, as we understand the position to-day, the Government is anxious for an indication of a basis of negotiation that would be acceptable to capitalists.

The Areas in Question.

It is to be regretted that no official map or plan showing the situation of these various State-owned mining leases has been published. This is in large measure due to the fact that in so far as proclaimed farms are concerned, mynpachts have not yet in one or two instances been demarcated, whilst in regard to unproclaimed farms an exact definition of the mineable areas, disposal of which is vested in the State, is of course at this juncture impossible. In the absence of any official map or plan, it may, however, be of interest to state the Government mining leases in respect of proclaimed ground. On the Further East Rand the names and numbers of the proclaimed farms upon which the areas are situated are:—

Modderfontein 167.—Extent, 2,633 claims, now property of Government Gold Mining Areas (Modderfontein) Consolidated, Ltd.
Witpoort 162.—1,180 claims; estimated capital required, £720,000.
Brakpan 166 and Schapenrust.—2,235 claims; estimated capital required, £1,700,000.
Geduld 174.
Klipfontein 172.
Welgedacht 177.

The Mooifontein-Vierfontein Claims.

In addition to these there is an important area of between 800 and 900 claims on the farms Mooifontein and Vierfontein in the Central Rand section. This area, of which the State owns the rights of disposal, lies immediately to the south of the Consolidated Langlaagte Company's property. During the past year or two, the Consolidated Langlaagte has become a highly profitable, dividend-earning concern. Development in the lowest levels is proceeding with satisfactory results, and since the reef is estimated to lie in the northern portion of Mooifontein at the moderate depth of 3,500 feet, it seems strange that the deeper (in so far as Brakpan-Schapenrust is concerned) Further East Rand areas on Brakpan, Schapenrust and Witpoort should have been offered in precedence of this Central Rand block, with its decidedly more attractive possibilities. We are indeed tempted to suggest that the offer of these eight hundred odd claims on Mooifontein and Vierfontein to capitalists on reasonable terms would result in a revival of interest in the State's mining leases, and might point a way to the solution of the bigger problem of the exploitation of the larger and dormant Government areas on the Further East Rand.

Messina (Transvaal) Development.

The May operations of the Messina were as follows:—Mill ran 25 days and treated 6,377 tons of ore, equal to 255 tons per day. Smelting furnaces ran continuously during the month and treated 116·5 tons of middling. Total production was as follows:—Mill concentrate, 1,046 tons, average assay value 39 per cent. copper; smelter matte, 80 tons, average assay value, 54 per cent. copper; total, 1,126 tons, average assay value 40 per cent. copper. 933 tons middling were reground and treated during the month, which is included in the above. 540 tons were current jig middling and 344 tons were lifted from old dumps. After treatment 654 tons of middling were recovered, assay value 6 per cent. Lilliput coal mine produced 348 tons of coal. Development footage for the month amounted to 433 feet. At the 6th level the drive west for a distance of 15 feet showed 13·8 per cent over 5 feet width. At 9th level, two crosscuts, one at 30 feet and the other at 90 feet west of No. 5 shaft, were driven through the lode to the south, and the ore at 30 feet gave 6 per cent. over 15 feet width, the ore at 90 feet gave 2·3 per cent. over 20 feet total width. At the 10th level the crosscut to footwall has cut through 3 feet of lode showing good bornite. All ore is now being hauled through the new No. 5 main shaft. Native labour is increasing. Concentrates shipped during the month, 1,090 tons.

Directors in Trouble.

The arrest has been effected in Johannesburg of Henry Jules Meyer and Bertram Sproull Fulton, and, in Machadadorp, of Petrus Leonhardus Wonter Verheyen. The first-named is a director of the African Finance Corporation, Ltd., and the West Rand Unified, Ltd. The second is secretary and director of the African Finance Corporation, Ltd., and the third is secretary of the West Rand Unified. Both are well known companies in Johannesburg. The preparatory examination is to be held in Pretoria on allegations of contraventions of the company law, including sections dealing with the return of a balance sheet, register of the names and addresses of the directors, and allotment of shares. A remand was granted to July 6 on bail of £50 each. The offices of the African Finance Corporation were raided and the books seized.

RECENT PROGRESS IN RAND METALLURGICAL PRACTICE.

A Brief Review of the Year's Work—Higher Duty, Better Extraction, Lower Cost—Features of New Equipments—No Separate Sand Collecting Tanks for the New Modderfontein's Proposed Plant.

ALTHOUGH the scope for metallurgical improvement is admittedly small in comparison with the room for improvement that exists in regard to underground work, there is nevertheless a field bounded on one side by a maximum extraction of gold content in the shortest possible time and on the other by the minimum of cost consistent with good work and sound and well made appliances in which the metallurgist, the metallurgical engineer and the chemist still have plenty of room for the display of ability. The Rand has ever been well served by metallurgists, and it is most satisfactory to observe that whilst no sensational developments in practice have been recorded in respect of last year's operations along the Main Reef series, there was nevertheless a steady and consistent improvement in method and result.

DUTY, EXTRACTION AND COST.

The stamp duty, for instance, which in 1911 was 7·88 tons per head per diem, and in 1912 was 8·39 tons, was last year improved to 8·71 tons. In other words, the average 100 stamp mill was last year made to crush 32 more tons in the twenty-four hours than in 1912; by no means an inconsiderable item. Then again in regard to the extraction obtained, whilst figures for all the groups are not available, it is noticeable that the plants on subsidiaries of the Rand Mines Company averaged an extraction of 95·73 per cent. in 1913, the highest figure being the New Modderfontein with 97·2 per cent. As to the cost of reduction and treatment work on the Rand, it is most satisfactory to note that concurrently with improvements in extraction and stamp duty there have been effected very considerable economies in regard to milling and cyaniding. We are not in possession of figures for the whole industry, but the metallurgical costs of the subsidiaries of the Rand Mines group are very interesting, and are, in some degree at any rate, typical of what has been achieved along the Main Reef generally during the past year or two. Speaking at the Rand Mines meeting, Mr. R. W. Schumacher, in dealing with the metallurgical aspect of the year's operations, remarked: "Dealing last year with working costs I informed you that we were everywhere trying to increase efficiency and prevent waste. We have continued to act on these lines. The following figures deal with the treatment costs on our mines during recent years:—

	Tons Milled.	Total Cost of Reduction	Average Reduction Cost per Ton		Saving in Pence per ton over previous Year.
			s.	d.	d.
1910	6,752,448	£1,505,381	4	6·3	—
1911	7,595,192	1,681,953	4	5·2	1·1
1912	8,244,944	1,709,655	4	1·8	3·4
1913	8,441,480	1,549,031	3	8·0	5·8

The 1913 treatment costs show a saving of 5·8d. per ton milled as compared with the costs of 1912, equivalent to a saving for the mines concerned of £197,866. The lowest treatment costs of all the mines in our group were 3s. 0·1d. per ton at the Crown Mines in 1913, where Mr. S. H. Pearce is reduction officer. The average treatment costs in April, 1914, of our group had fallen to 3s. 7·3d. per ton. All credit is due to Mr. F. L. Bosqui, our consulting metallurgist, to his staff and to the reduction officers on the mines for the savings and improvements that have been effected."

THE BARNATO PLANTS.

The mines under the control of the Central Mining and Investment Corporation and the Rand Mines, Ltd., have not, however, been the only properties to record advances and show improvements during the past year. Indeed, in every group progress has been recorded—nothing sensational, of course, but good steady improvement. Amongst the mines of the Barnato group, for instance, last year witnessed distinct advance in metallurgical practice, and we understand that the results secured have been bettered this current year. Features of above ground work on the Johannesburg Consolidated Investment Company's subsidiaries were the satisfactory running of the Van Ryn Deep's new mill and of the Consolidated Langlaagte's similar equipment completed some little while ago and also the very material improvements secured in regard to extraction at the Witwatersrand and New Primrose plants. In 1912 prior to the installation of the tube mills the final residue at the latter mine was somewhat high, but the residue for the year 1913 was reduced to ·248 dwt. per ton. As to the Witwatersrand or Knights Mine, the new tube mill installation commenced working in October, and effected a substantial improvement in the extraction, the value of the residues in December being reduced to ·262 dwt., as compared with an average residue for the year of ·477 dwt.

THE FURTHER EAST RAND'S NEW EQUIPMENTS.

Before concluding this brief review of the metallurgical progress of last year, it will be worth while to briefly note the salient features of the new equipments now under construction on the Further East Rand. Two quite new milling and cyaniding plants are now being erected—the one at the Modder Government Areas and the other at the Modder Deep Levels. In addition the Modder B. plant is being extended, and when development has progressed further in the vicinity of the circular shaft a new mill and accessory plant will be installed at the New Modderfontein. At the Modder Government Areas the plant will consist of 100 stamps, each of 2,000 lbs. weight, and ten 16 ft. 6 in. by 6 ft. tube mills. Amalgamation will take place after the coarser ore has passed through the tube mills, and the pulp will then be separated by cone classifiers into sand and slime for cyanide treatment. The sand plant will have three collectors of 56 feet diameter, each capable of holding 740 tons of sand. The sand from the collectors will be conveyed by belts and delivered by a Blaisdell distributor into the treatment tanks. There will be eight treatment tanks of 56 feet diameter, each capable of holding 740 tons of sand. The slime plant will consist of six collectors, each 70 feet diameter and 19 ft. 6 in. high, including the cone bottom; nine air agitating tanks, 45 feet high and 15 feet diameter; and a Butters filter plant. Precipitation will be in the usual divided boxes filled with zinc shavings. Indeed, the general design of the plant is on similar lines to that of the Van Ryn Deep, only the probability of considerable additions in the future has been kept in view throughout, and this has caused modifications of many details. The Modder Deep plant will also be modern in every detail. The reduction works will consist of sixty stamps and six tube mills, sands, and slimes plants, having a capacity of thirty thousand tons per month, excluding Sundays. At the Modder B. during the past year the mill was pressed a good deal and was worked beyond its capacity, giving a higher residue than that which would result by the best metallurgical practice. Several additions were therefore made to the cyanide plant, the most important being two extra slimes tanks and a clarifier, whilst two additional sand tanks have been put in. The additional stamping capacity will consist of 16 new Nissen stamps and a tube mill. This new plant is now under construction and should commence work at an early date. In connection with the proposed new equipment for the New Modderfontein, a feature of particular interest will be the absence of separate sand collecting tanks. Mr. F. L. Bosqui, the consulting metallurgist, is confident that with the good classification of sands and slimes that is now being obtained by means of cones the sand can be collected and treated in the same tank.

RECENT PROGRESS OF INDUSTRIAL HYGIENE.

Need for Continuous Physical Examination—Co-operation to Secure Good Conditions Essential.

[BY JOHN W. LUTHER.]*

THE fact that this Institute of Mining Engineers has invited us to address you on hygiene this evening, I consider extremely significant, indicative of this time of social progress. Twenty-five years ago such a thing would have been an impossibility. Human life has, until quite recently, been held cheap, while material things have had a distinct value in all ages. A machine which has some intrinsic value has always been most thoughtfully selected and tenderly cared for; but what about the poor human machine? If old and disabled from accident or disease incident to his occupation or not, he could be discarded without pecuniary loss and a new human machine substituted. But this is no longer possible, profitable, or desirable. The discovery of the cause of a great many diseases, through the remarkable advances in the study of bacteriology, has in a great many instances led to prevention and in some cases cure. This has led men of an inquiring mind to investigate practically all diseases resulting in the discovery of cause, and prevention in many of them. The known occupational diseases fell in the class that was investigated, and many of them were found to be preventable.

GOVERNMENT CONTROL OF SANITATION.

Both Federal and State Governments looked into the unsanitary conditions in workshops. The American Association for Labour Legislation sprang into existence, and now every State and the Federal Government have passed laws governing the sanitary conditions under which labour is to be performed. These investigations by the Governments and individuals have done more, however. They have shown that almost every occupation has its peculiar pathology, or that certain diseases are more prone to occur there than in other occupations. The morbidity and mortality rate for tuberculosis is far higher in clerks than in farmers; in pottery men than in furnacemen; in brief in those whose work is light and confining than in those doing heavy work in the open. Certain occupations are classed as dangerous in consequence of attracting a class of workmen who may be peculiarly susceptible to disease. Hence the importance of examining every employee before he is employed to see that he is placed at work which he is physically fit to perform with the least possible detriment to his own well being. If this were carried out universally, I believe the stigma of occupational disease would be removed from many occupations. An outcome of legislation regulating the sanitary conditions of workshops has been the factory inspector. This is a good thing, for he helps those who want to help their workmen, and forces into line those who do not. Another good result is the reporting of all cases of accidents and occupational disease and compilation of accurate statistics. But here a difficulty arises. Just what is an occupational disease?

COMPENSATION AND LIABILITY LAWS.

The American Association for Labour Legislation is waging a most active and successful campaign to secure the enactment of a model Bill by all States not already provided with similar legislation. Their Bill, the Kern McGillicuddy (H. R. 14994), they are endeavouring to have passed by Congress to apply to all civilian employees of the Federal Government. It differs from many Bills in that it provides compensation for occupational diseases as well as for injuries. It reduces the waiting time to three days instead of fifteen. It provides $66\frac{2}{3}$ per cent. of regular pay for disabled workers during the period of their disability. It provides reasonable benefits for widows, children, and a limited class of other dependents. The first thought of the employer is, how can I protect myself? How better than by sanitation, safety devices, and physical examination of all employees to determine the physical soundness of all of them. The ultimate outcome will be that instead of being employed and doing what they can, many will be debarred from work and will fall upon the taxpayer for support.

PHYSICAL EXAMINATION.

Physical examination is one of the employer's defences against compensation legislation, for without it great advantage may be taken of the employer by a workman demanding compensation for a pathological condition which may have existed before his employment. Hernia is a notable example of this. Having been examined before employment, each man placed in a position to counteract an occupational disease should be inspected monthly. This inspection should be directed toward the determination of the existence or absence of the disease peculiar to the occupation. In addition, each employee should be subjected to a semi-annual examination which should be fairly thorough. By this method the development of almost any occupational disease can be discovered in its incipiency and the man transferred to another part of the plant to prevent its advance and in a great many instances, perhaps, effect a cure. In addition to the eradication or diminution of occupational diseases, a record is made by means of which can be seen at a glance whether or not the man is fitted to the work for which he is employed. If not, he can be transferred to other work. Adopting this policy, the New Jersey Zinc Company keeps its men in the highest degree of physical fitness and accordingly increases their efficiency. I think this will be found to be true in the quantity and quality of output, the returns for which will more than pay the cost. In addition to this there will be less lost time, the men will be more contented at work, consequently labour troubles will diminish, and it is natural to suppose that the influence of cleanliness, general hygiene, and physical care at work will be felt at home. In connection with this might be mentioned our method of handling the sick and injured. Any man hurt or taken ill on the plant is referred to our emergency hospital, where he is given first-aid treatment and then referred to the hospital. This man cannot return to work until given a written release by the surgeon, who states whether he can resume his usual work or should be given light employment. Any man who reports off on account of sickness is reported to our district nurse, who looks him up and reports on his condition. Before this man returns to work the physician in attendance must fill out a form giving the diagnosis of the case. This is sent with the man to the surgeon, who releases him and allows him to return to work. By this means we try to overcome malingering.

VALUE OF CO-OPERATION.

There is one important point in all sanitary, safety and welfare work which must not be forgotten. That is, that to carry out effectively any plans it is essential to secure the co-operation of the men. How can this be better assured than by educating them? This can be accomplished by health talks, illustrated lectures, distribution of health pamphlets, training of the first-aid squad, and by the use of Tolman's "Hygiene for the Worker" (American Book Company, New York). Our first-aid squad makes regular tours of inspection of the plant, reporting not only unsafe places, but notes what they may consider to be unsanitary conditions. Cleanliness is essential everywhere and is, to my mind, the keynote of sanitation. Infection of wounds is reduced to a minimum by first-aid treatment. Dust, fumes, gases and vapours are cared for by adequate ventilation, and by hoods. In such places as the bag-room and the packing house of the oxide department, where the dust cannot be removed by any means, the men are required to wear respirators. The ordinary cover respirator is used, though one of our men is working on one which will far exceed this in efficiency, while a large part of the objectionable features will be done away with. Clean sponges are provided and given to the men whenever they want them, and every respirator is sterilised by soaking in carbolic acid, 1 to 40, for an hour, and then thoroughly washed every week, or more frequently if necessary. I often hear the remarks, "We cannot get our men to wear respirators," and until I visited the Pullman plant I supposed this to be true. They demonstrated to me conclusively that it can be done; that men will wear them if the fact that they must, that failure to comply means immediate dismissal, is impressed upon them when they are employed. Success or failure here depends on the atmosphere created by the men above. Respirators at their best are dirty, warm, uncomfortable, and not wholly efficient, so any improvement will be welcome. The present respirators when not in use, before being transferred to another man, should be kept in an atmosphere of formaldehyde for at least 24 hours, then washed in weak ammonia solution and aired, and clean sponges and rubber straps supplied. This treatment will not only sterilise them, but will prevent the rapid deterioration of the rubber and will not harm the metal parts.

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*Abstract of an address delivered before the New York section, Amer. Inst. Min. Eng., April 22, 1914.

S.A. Option Syndicate.

The South African Option Syndicate's declaration of output from Somabula for May is 100 diamonds, weighing $137\frac{3}{4}$ carats, and valued at £684 9s. 6d. The largest stone found weighed $18\frac{1}{4}$ carats, and was sold for £244. Other stones weighed $6\frac{1}{4}$ and $5\frac{3}{4}$ carats, and realised good prices.

Harmony Estate (Transvaal).

The Harmony Estate (Transvaal) Development Company, Limited, has just been registered at Somerset House by Mr. R. Brooks, solicitor, of 24, Lawrence Lane, E.C., with a nominal capital of £60,000 in 200,000 ordinary shares of 5s. and 200,000 deferred shares of 1s. The objects are to acquire any concessions, mines, mining leases or rights, and metalliferous land in the Transvaal or elsewhere, and to adopt an agreement with Harmony Proprietary, Ltd., and others. Minimum subscription, 10 per cent. of shares offered to the public. The first directors are R. W. Mitchell, Middelburg, Transvaal, and Anerley, Kent (chairman of Harmony Proprietary Co., Ltd.); T. Haig Smellie, 5, Grove Road, Brixton, S.W.; and A. Knopwood, St. Andrews, Grand Avenue, Bournemouth (director of Harmony Proprietary Co., Ltd.). Office, 3, Budge Row, Cannon Street, E.C.

THE YEAR WITH THE ROBINSON DEEP.

Points from the Annual Reports—Net Revenue, £299,362.

The profit from operations at the Robinson Deep for the year ended 31st March, 1914, amounted to £324,725. Interest and sundry revenue brought in £7,515. Provision for Government tax absorbed £22,055, contribution to Miners' Phthisis Compensation Fund £9,849, French Government duty and stamps £243, sundry amounts written off for depreciation, etc., £730; leaving a net balance of revenue over expenditure for the year of £299,362. To the balance on appropriation account at 31st March, 1913, of £118,342, has been added the balance from income and expenditure account above-mentioned of £299,362, making a total of £417,704. This has been dealt with as follows:—(1) Dividends paid to shareholders, viz., 25 per cent. and a bonus of 2½ per cent., amounted to £275,000. (2) Votes to the reserve for additions to and renewals of machinery, plant, etc., £25,000; less sundry renewals and replacements during the year, £18,411; total, £6,588. (3) Profits appropriated for capital expenditure, viz.:—(a) Provision for payments to the Government of the Union of South Africa, on account of undermining rights purchased, £30,264; (b) shaft sinking, £444; total, £30,708; leaving a balance to the credit of appropriation account at 31st March, 1914, of £105,408. Mr. C. D. Leslie, the Superintending Engineer, writes:—

The fully developed ore reserves at 31st March last are estimated at 1,533,000 mine tons of an average grade of 5·9 dwts., and the partially developed ore at 417,000 mine tons of an indicated average grade of 5·8 dwts. per ton. Notwithstanding shortage of native labour and the industrial disturbances of July and January last, the mine has been able to accomplish sufficient development to maintain its ore reserves, but the tonnage crushed has been reduced by some [illegible] tons. The value per ton crushed is lower by 1s. 11·970d. and working costs by [illegible] per ton, giving a reduction in working profit of £4[illegible],853 3s. 3d., exclusive of an amount of £5,688 1s. 1[illegible]d. placed to reserve during the year. There will be an appreciable decrease in the high grade tonnage to be mined from the water-right ground, which should be nearly worked out during the present financial year, but it is hoped that the mine will have the benefit of industrial peace and a more plentiful supply of native labour to help it to counteract the adverse effect of this on profits as compared with last year. The management has been unremitting in attention to secure safe working conditions underground, and the highly successful results obtained in this direction have been helped considerably by sand filling in the mine workings. Some heavy work has yet to be incurred for the further support of No. 2 incline shaft and the lower portion of No. 2 vertical shaft, because the ground has been weakened through the influence of a soft dyke exposed at intervals in these shafts. This is being carried out in a thoroughly systematic manner, and it will be profitable to put in substantial work, as the mine has a probable life of eight to nine years, dependent upon the rate at which labour and general conditions will permit it to be worked.

Mr. J. J. Wessels, the manager, writes, *inter alia*:—

In my report last year I indicated the likelihood of a large increase in tonnage, and I expected to reduce working cost appreciably. At first, up to the end of July, we had an average native labour complement of 3,966, ensuring us one of the most important factors in producing good results. After July, however, everything was changed and notably the effect was that time-expired natives did not renew their contracts, new boys did not come in, and our average strength for the last eight months was as low as 2,928. This big drop had its natural effect. In addition, the state of tension continuing on from July and renewed in January, made things very difficult all along. The initiative of the staff, both surface and underground, was temporarily checked, and we were not able to concentrate all our efforts on improving efficiency. Now at the end of the year we are confronted with a position which it would have been impossible to anticipate 12 months ago. The reduction of 9d. per ton in working costs is the utmost we have been able to achieve in face of the great shrinkage in native labour and the critical state of affairs ensuing on the two strikes that have fallen within our financial year. The actual extraordinary strike expenditure, £4,381 18s. 1d., must be regarded as representing only a fraction of the loss suffered by the company. During the year under review 359,370 tons of sand were sent underground at a cost, including expenditure in underground barricading, launders, etc., of £11,396 10s. 3d., or 7·16d. per ton. The benefit of supporting underground workings this way is being realised more and more. At the present time the sand is gradually being directed towards filling in areas adjacent to No. 2 incline shaft which were mined and caved many years ago and which are now showing further signs of weakness. In addition to the amount spent on sand filling, a further sum of £34,542 4s. 9d. was spent on timbering and waste packing for the purpose of keeping working places safe. The great object aimed at on the Robinson Deep for the last four years has been to save labour by the use of machine drills, and it is gratifying to note that this line of experiment is being generally taken up. During this year we have had four recent types of water-fed hammer drills in use. Some of them, while capable of producing good results, are not uniformly reliable, and maintenance is very expensive. The making and sharpening of steel is twice as expensive as with reciprocating machines. At present it seems as if the merits of the water-fed hammer drill still require complete demonstration.

ANOTHER MADAGASCAR OIL FLOTATION.

The Betsiriry Company—Points from the Prospectus.

In the advertisement pages of this issue will be found an abridgement of the prospectus of the Betsiriry Oil Fields, Ltd., which is being floated with a capital of £75,000 to acquire rights over 13 areas held by the Taylor-Cornell Madagascar Petroleum Syndicate, and also the two drilling plants and other assets of the syndicate in Madagascar. It is set out as being an object of the company to prospect and develop these areas for oil, and, as opportunity offers, to form subsidiary companies to take over and develop the various portions of the property. The distribution of shares is as under:—[illegible] shares issued as fully paid to vendors, £[illegible]; 12,500 shares issued as fully paid to promoters, £12,500; 17,500 shares to provide £17,500 for working capital and the £7,500 payable for working plant now in Madagascar, £17,500; 10,000 to be held in reserve, £10,000; total £75,000. The directors of the company are Messrs. J. Frank [illegible], W. Edgar [illegible], Col. J. [illegible], and Messrs. A. [illegible] and J. E. S. [illegible]. The prospectus states, *inter alia*, that the extent of ground covered by each "Permit" averages about 10 square miles, the total extent being 31,115 hectares, about 130 square miles, forming one compact block roughly measuring about 20 miles by seven. "These areas were very carefully selected and secured by gentlemen who had previous experience of oil and its occurrence, and who were familiar with the locality. After they had selected the areas, which in their opinion had the most desirable oil-bearing characteristics, they were followed by other persons who secured ground on all sides of their selection." The distance from the West Coast to the concessions is about 80 miles. The Manambolo River is navigable for light draught vessels from the coast to the concessions for six months of the year, and for the greater part of the way, at all times. The plant now on the concessions was conveyed there by water all the way. This waterway provides a cheap and reliable route for export, until it may be advisable to lay down pipe lines. The plant being purchased comprises two complete drilling outfits, which were specially designed for work in Madagascar, with accessories and tools, and each capable of drilling holes 2,500 feet deep. One of these drilling plants did the work mentioned later herein, and the other is quite unused. There is also well casing of various sizes, wagons and oxen, as well as certain river transport plant. The company on flotation would, therefore, having plant on the spot, be ready for work as soon as the necessary staff is available. On account of the primitive nature of landing facilities and the difficulty of procuring land transport the exploitation of this part of the country has been very much neglected. Although the occurrence of oil was an established fact, the only actual boring done on these fields up to November, 1913, was that done on this property. An option over these areas was granted by the Madagascar Oil Development Co., Ltd., who did certain work, but on their funds becoming exhausted and work being stopped in consequence, the option lapsed. Boring records of that company disclose the following results and information of work done:—Three holes were put down. The first attained a depth of 250 feet, when ebullitions of mineral gas were reported to be so frequent and violent that the hole became unworkable. The next hole passed through petroliferous sands at 591 feet, 680 feet, 766 feet, and 813 feet. This borehole proved to have been unfortunately located, being sunk on a syncline, and though petroliferous sands were encountered, the flow of oil was negligible and the hole was abandoned. Monsieur Levat later confirmed the view that this site was situated on a syncline. The site of the third hole might also have been better chosen, but nevertheless a small flow of viscid oil at 465 feet was encountered, and was estimated by the manager to be about nine barrels a day. Three other showings of somewhat similar oil were passed through before reaching a much more fluid oil of a bright amber colour, which was found at 1,150 feet. Almost simultaneously with this strike an inrush of artesian water prevented the value of this stratum from being properly determined. Want of money compelled the stoppage of work, which up to now has not been resumed. Numerous seepages of petroleum occur on the property, forming in some instance small pools of oil and bitumen or asphalt. An extensive exposure of oil saturated sandstone occurs, as exposed by river erosion. Both above facts point unmistakably to the probable presence of an extensive oil saturation, and the existence of various distinct anticlines affords strong reason for concluding that there are oil concentrations on these concessions. Engineers and geologists who have visited and reported on the property makes special reference to these indications.

GRAPHITE-COATED DIAMONDS FROM THE PREMIER MINE.*

By P. A. Wagner, D.Eng., B.Sc., M.E.

Of the numerous curiosities in the shape of "freak" diamonds which the Premier Mine has yielded, none can lay claim to greater scientific interest than four small stones which, through the courtesy of Mr. P. Ross Frames, the writer was recently enabled to examine. They are of the nature of well formed diamond crystals coated with a thin film of graphite, which renders them black and opaque. According to Mr. J. Ehlert, the chief valuator of the Premier Company, stones of this character are recovered from time to time, but having never been observed *in situ*, there is complete uncertainty as to whether they are distributed throughout the whole pipe or confined to a definite column of blue ground. It is worth recording, however, that almost every Premier "parcel" contains diamonds,[1] the surface of which is thinly coated or dotted over with small particles of black crystallised carbon, which may also prove on further investigation to be a form of graphite. The largest of the four specimens which form the subject of the present note originally weighed about 2·5 carat, and is in the form of a combination of a trisoctahedron, rhombic dodecahedron and octahedron; the dodecahedral faces being very distinctly striated parallel to the octahedral edges. One corner of the stone has been broken off, and at this point one could clearly see that the graphite formed a pellicle, about ·02 millimetres in thickness, covering a brown diamond of inferior quality. The mineral builds minute plates and scales up to ·2 millimetres in diameter. It is of dark blackish gray colour, possesses bright metallic lustre, and very readily marks paper. With the object of determining the properties of the graphite a small quantity was scraped off the diamond by means of a penknife. A portion of the material thus obtained was placed in a small porcelain crucible and treated on a sandbath with a mixture of concentrated nitric acid and pure potassium chlorate. Under the influence of this powerful oxidising agent the mineral was speedily converted into graphitic acid, which on being heated was in turn converted into a dull black substance—the pyrographitic oxide of Berthelot.[2] The remainder of the scraped-off graphite was heated to dull redness in a platinum capsule after having been previously moisted with (a) concentrated nitric acid, and (b) concentrated sulphuric acid. The mineral suffered no appreciable alteration as a result of this treatment, and it is clear, therefore, that we are dealing with a non-swelling graphite; or, to adopt the nomenclature of Luzi,[3] with graphitite as opposed to graphite. To test the combustibility of the graphite in air, the diamond, to which appreciable quantities of the mineral were still adhering, was mounted upon an inverted scorifier and introduced into a gas-fired muffle furnace, the temperature of which was gradually raised from 650° to 720° C. Combustion appeared to commence at about 700°, and after the furnace had been kept at a temperature of 720° for ten minutes all the graphite had disappeared, leaving behind minute specks of yellowish brown ash. The faces of the diamond, freed from their graphite coating, are seen when examined under the microscope, to be curiously pitted, but this may possibly be a result of incipient oxidation. The important question in connection with these remarkable diamonds relates to the manner of formation of the graphite. The conditions under which the mineral occurs suggest that it may be of secondary origin, and in this connection it will be recalled that at the temperature of the electric arc diamond is slowly transformed into graphite,[4] and that the graphite of the electric arc is of the non-swelling variety.[5] It is so difficult, however, even to conceive the circumstances in which diamonds occurring in a kimberlite pipe could have been raised subsequently to their formation to an enormously high temperature, that the possibility of the graphite having been formed as a result of the paramorphosis by heat of the crystals which it incrusts appears very remote. Another explanation which suggests itself is that the graphite coatings may have been developed in consequence of relief of pressure (1) before the growth of the diamond crystals had actually ceased, or (2) at a time when the newly-formed diamonds were still at a comparatively high temperature. On either supposition, however, it would be difficult to explain why the phenomenon should be confined to so small a proportion of the diamonds found, and one is thus forced reluctantly to add to the already formidable list of unsolved problems in connection with the South African kimberlite occurrences that of the graphite-coated stones from the Premier Mine. The writer gratefully acknowledges his indebtedness to Professor G. H. Stanley and to Messrs. M. Thornton Murray and D. P. McDonald for having assisted him in his investigations.

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* Paper read before the Geological Society of South Africa.

[1] *cf.* Wagner, *The Diamond Fields of Southern Africa*, p. 144. [2] *vide.* Doelter, C. *Handbuch der Mineralchemie*, p. 59. [3] *Ber. d. deutsch. chem. Gesellschaft*, xxiv., 4085 (1891); xxv., 214 (1892). [4] *cf.* Moissan, A., *The Electric Furnace*, p. 59; and Bauer, M., *Edelsteinkunde*, p. 140. Several experimenters claim to have effected the superficial conversion of diamond into graphite at temperatures ranging from 1200° to 1700° C. (*vide* Doelter, *loc. cit.*, pp. 38-39), but careful investigations by Doelter have proved that true graphite is not formed even at 250[illegible] C. [5] Moissan, *loc. cit.*, p. 50.

Free State Diamonds.

Discussing the prospects of the Theunissen diamond proposition, in an interview with the *Friend*, Mr. Gustav Gaumann, of the Doorn Diamond Syndicate, said:—"It is purely and simply a Free State concern. The small syndicate which has been formed consists of Bloemfontein and Kroonstad men only. It started in quite a small way. Originally only 180 shares were allocated. But we are determined to go on with our project. Even if the full capital is not subscribed it is probable that a company will be floated. The mine is in the Theunissen district, quite near the main line. Our syndicate have acquired two farms, and the exact spot where diamonds have been struck is about 1½ miles north of the Thor mine, 3 miles north-east of Drie Kopjes, and 5 miles north-east of Lion Hill, now called Invicta. We have secured two properties adjoining one another. The syndicate holds long mining leases. We have struck excellent soil, and the indications are splendid. We have not yet struck the main pipe, but it is on the property. The deposit in which the diamonds were found was of the right kind, and was not in any way water worn. The diamonds found are of a fine quality, and they were taken out of the top part of the soil. We got together about 20 loads of the soil out of the prospecting shafts, and had it hand washed. We found diamonds of excellent quality to the extent of 2¼ carats." The capital of the company will be £25,000 in £1 shares.

PROSPECTS OF THE LEEUWPOORT (AFRICAN FARMS) TIN MINES

Points from Annual Reports—Price of Product the Only Unsatisfactory Feature.

The price of tin is the only unsatisfactory feature in the prospects of Leeuwpoort Tin Mines. The following figures give the results to the end of the year 1913, being for the months of October, November, and December, 1913:—Mill, 17 stamps (2 Nissen and 15 Californian) ran 68·80 days; ore milled, 9,827 short tons, duty per stamp per diem, 8·40 short tons; concentrates won, 110 long tons, average grade of concentrates, 64·01 per cent. M.T.; average grade of ore treated (pulp samplings), 1·82 per cent. M.T. In addition to the above-mentioned 110 tons of concentrates produced, there was approximately 32 long tons of 64 per cent. metallic tin grade to be obtained from accumulated partly-treated "middling-product" concentrates in circulation throughout the plant, and awaiting final treatment. During the year under review the mill was only crushing for three months, and during the two months October and November, 1913, for the purpose of conditioning the plant, ore of only poor quality was treated. In his annual report for the twelve months ended 31st December, 1913, Mr. S. C. Thomson, consulting engineer, writes:—"I can only point out that a tin dressing plant is most complicated, and must necessarily be especially so when designed to treat entirely dissimilar ores from the numerous occurrences or mines on your large property, some of the ore being fine grained, some coarse, and some containing a large proportion of either iron oxides or sulphides. Taking these factors into consideration, one cannot help but be pleased with the results obtained, especially knowing that for the first few months the lower grade ore was treated for experimental purposes. The working costs are very satisfactory, and we can only conclude that if the price of metallic tin maintains a reasonable figure this mine will have a very successful future. New discoveries in addition to the mines at present being developed will very likely be made, and as Mr. Jameson points out, there is a large area of alluvial which will undoubtedly be profitably worked."

Mr. J. I. Jameson, the manager, writes, *inter alia*:—

The total development and exploratory work accomplished during the year was 7,6[illegible] feet, included in this total is 632 feet of main shaft sinking and the small amount of 75 feet of exploration or prospecting. The average monthly footage for the period was 641 feet. The greatest amount of development work has been done at the Sprint Workings—namely, 1,821 feet (equal to 152 feet per month), of which 217 feet represents sinking at the main incline shaft. The total cost of development and exploration, exclusive of main shaft sinking, was £14,791 12s. 2d., equal to £2 [illegible] 2d. per foot. No additional main shafts have been equipped during the year. The original prospecting shaft at the Southern Sprint Extension, equipped with ox haulage, was sunk an additional 125 feet to a total depth of 3[illegible]3 feet at the end of the year. This shaft has now become the main incline shaft for these workings, and will be regraded, timbered and generally reconditioned, and be equipped with steam haulage (double drum hoist) during the present year (1914). Of the remaining five main shafts at the five separate workings, sinking has been continued at three during the year, namely, Sprint West and [illegible] Workings, as forecasted in the last annual report. At the two extreme end workings (North and South), namely, Nek and [illegible] South, no sinking has been done at the Nek, and only [illegible] feet at [illegible] South Working at the beginning of the year 1913. At the New Strike Area one of the original prospecting shafts (No. 1 [illegible]) will be utilised as a main shaft during the present year. Ultimately a new vertical shaft may be required to further exploit this area. When this work has been completed, the only portion or workings [illegible] will be the No. 1 and No. 2 Quarry Workings. The [illegible] for these opencast workings is being [illegible]. The total cost of shaft sinking, including the regrading and reconditioning, was £[illegible], equal to £7 [illegible] per foot. At the New Strike area (of which mention was made that very numerous lodes exist) [illegible] for some time in following these [illegible] in comparatively [illegible] quartzite and shale beds, owing to local geological disturbances. However, one well-defined lode has been successfully [illegible]. The results of development work have been distinctly encouraging. Ore is now being stoped from this lode and sent to the mill. The [illegible] of this area lies partly in the comparatively high grade nature of the ore [illegible] of considerable [illegible]. Towards the end of January, 1913, it was decided to gradually curtail the amount of development work each month until after the milling and concentrating stage had been reached. An average monthly figure was arrived at, and development and shaft sinking were limited to this amount. The main incline shaft at the Sprint Workings was stopped (curtailment policy) on the 24th May, 1913, below the fourth level (600 feet) at 652 feet in good values, 13·1 per cent. metallic tin over 7½ inches—and has not yet been restarted. Owing to the shortage of labour, consequent on starting stoping and milling operations at the beginning of the native migratory season (October), until the end of the year there were only sufficient native labourers on our books to provide for stoping, and the requirements of the plant and surface generally; the result being that the total footage shows a reduction of 4,441 feet, when compared with the previous year (1912). During the ensuing year, development work will be energetically undertaken at the several workings, in order to maintain our position of having the mine satisfactorily ahead of the mill requirements. No new discoveries of outstanding importance have been made. The year's work has been confined to the developing of the several known points. The prospecting, or exploratory work, undertaken consisted of only 75 feet of underground work and 100 feet of trenching—all within the New Strike area. Certain known promising areas will be prospected during the year 1914. The estimate of milling ore developed, exposed, and at grass, at 31st December, 1912, was 110,519 short tons of average 2·25 per cent. metallic tin value. Reconverting these figures to mining or stoping short tons, they become 117,623 short tons of average 2·13 per cent. metallic tin value. At 31st December, 1913, on the same basis the figures in mining tons are as follows: Total ore at grass, 28,361 short tons, value metallic tin 1·27 per cent.; total ore exposed—developed, 96,031 short tons, value metallic tin 2·47 per cent.; total, 124,392 short tons, value metallic tin 2·20 per cent. Assuming an average allowance of 8 per cent. for sorting, the milling tons become 114,441 milling tons of 2·38 per cent. metallic tin, which equals 27 months ahead of the milling requirements at 4,200 tons milled per month. It is expected that as additional workings become available, it will be possible to raise the grade of ore to near the normal figure which was anticipated on milling. Owing to comparatively low working costs, it has been ascertained that a reasonable profit can be made on ore as low as 1·7 per cent. metallic tin pulp grade with Straits tin at only £175 per long ton. The following figures give the results to the end of the year, which includes only one, more or less, normal month of milling—namely, December, as explained above: Mill ran, 17 stamps—2 Nissen and 15 Californian, 24 hours basis, October, November, December, 68·80 days; ore milled, 9,827 short tons; duty per stamp per diem, 8·40 tons; concentrates won, 110 long tons; average grade of concentrates, 64·01 per cent. metallic tin; average grade of ore treated (pulp sampling), 1·82 per cent. metallic tin. The two Nissen stamps, Dorr thickener, R. J. classifiers, and Buss Tables, which are new features in a tin plant in this country, have fully justified their inclusion, and are doing good work. Owing to the comparative fineness of the disseminated cassiterite, and lack of "free" tin—fine crushing (400-300 mesh) has had to be resorted to—which naturally increases sliming and consequently the subsequent concentration difficulties. The plant as a whole has run well and given satisfactory results for the initial stage, when it is remembered that the property is a new one, the lodes consisting of greatly divergent complex ores, which are obtained from several very dissimilar workings or mines. As the ore becomes more pyritic with increasing depth, additional roasting and regrinding plant, together with the necessary concentrating units, will be required. Owing to the fairly complete and efficient classification, no additional slimes plant will be required, notwithstanding the fact that fine crushing is necessary. There is hardly sufficient poor slime feed at present for 24 rag frames. Given favourable development results throughout the present year, which we have reasonable grounds to expect, the present stamping capacity could with advantage be augmented in the near future by, say, four light Nissen stamps.

Crown Diamonds.

The following are the results of the operations of this Company for the month of May, 1914:—Loads washed, 33,172, which yielded 3,101¾ carats.

Sakalava Madagascar Proprietary Oil Fields

The secretary writes under date 16th June, 1914:—"We have to-day received the following cable from Mr. S. A. R. Stertchly: "Number two well (Marobaolo) is 280 feet deep, showing of heavy oil.""

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LOCAL INDUSTRIES AND THE S.A. NATIONAL UNION.

Points from the Annual Report on the Manufacturing Industries.

The annual report of the S.A. National Union is full of valuable and interesting reading. Inter alia, it is pointed out that a good deal has been done by this Society to stimulate the use of the locally produced article, and the increasing sales made prove that much of the early prejudice has been broken down. Biscuit-making is an industry that has assumed considerable proportions here. There are a number of factories in different parts of the Union, and the extent of the output may be judged by the fact that the total imports into the Union last year were only £60,394 worth. Although the trade operates under a protective duty, competition has kept down the prices of the local article, while it has, of course, been necessary to produce a quality equal to that of the imported varieties. Several of the milling industries of South Africa have been established for a long time, but the business has had a tremendous stimulus in the last few years. There are now a number of large concerns in various parts of the Union, whose products are on sale all over the country. But importations of the raw material are still necessary to a large extent—they were £742,781 in 1913. It is expected, however, that with the continued improvement in the wheat growth in South Africa importation will be reduced to a minimum in a few years. The power to do this is entirely in the hands of the farmer.

Relatively our purchases of canned, bottled and dried fruits, jams and jellies have considerably decreased, but there are still far too many imported brands in evidence. These industries should be pushed extensively, for with the opening up of the interior there will be an ever-increasing market, and the existing one is far from being fully supplied. And they deserve our support, for all the materials used are of local origin.

In no line has there been a bigger drop than in candles—the imports of which are now purely nominal. The keen competition and the protective duty of ½d. per lb. brought about the formation of Prices (S.A.), Ltd., who, as well as several other large factories in the Union, now turn out many varieties of candles. It is interesting to note that whereas candles cost here 1s. 6d. per lb. twenty years ago, they can now be bought at 6d. per lb. The same reason that operated in the case of candles applies to the soap-making industry. The well-known firm of Lever Bros. came out recently and established factories in Durban and Capetown, where well-known brands of soap, such as "Sunlight," "Velvet Skin," etc., are now made. Possibly other oversea firms may enter the trade in this article before very long. It is doubtful if the full extent of the market amongst the native population of South and Central Africa for soap, candles, matches, salt, sugar and other South African products is fully realised. The native soon learns to look upon these as necessities, and so the demand is likely to expand rapidly in the next decade.

The furniture industry is one of the most important here, and it is satisfactory to see that it is steadily increasing. Furniture is still made in the home, but not to the extent of thirty years ago. In many respects it is a pity that this handicraft is disappearing, but machine-made furniture is a formidable rival. Although several of the indigenous woods of the country have been successfully utilised for the purpose of furniture-making, in most cases their weight militates against their general adoption, except in the case of teak. In another part of this report regret is expressed that the growing of commercial timber has not yet been undertaken. There is abundant scope, for this is an import that reached £930,833 in 1913.

The tanning and boot-making industries of South Africa are so well known as to need no particular reference. It is gratifying to find that various Government departments are encouraging these industries in a practical manner, although at least one large order was sent out of the country not long ago. These are, of course, only a few directions in which the South African manufacturer is moving. When we look round and see the diversity of enterprise and the extent attained in particular cases, we cannot but feel that real progress has been made. But after all, few of the industries that depend on the custom of the housewife are as large as they might or should be. As we wrote in a recent appeal, what is wanted is a determination on the part of everybody to actively support all genuine forms of local industry. Everyone should show patriotism in that way, for by doing so we are, after all, only helping ourselves. The greater the prosperity of the country as a whole the greater the prosperity of every man and woman in it. It seems necessary in every country, even in the older ones of Europe, to remind people of this obvious fact. The exhibition is looked upon as one of the best means of creating public interest in the subject and of "teaching the lesson of patriotism and pride of country." In Australia the "All Australia Week" has done much good in fostering that spirit, but so far we have not been able to arouse the enthusiasm of manufacturers here in an "All South African Week." We feel sure, however, that a useful advertisement of South African products can be obtained by this method, and it is proposed to approach manufacturers again on the matter. Properly carried out the scheme is an excellent way of periodically stimulating interest in a subject that otherwise may not get attention. But it is, in addition, necessary to advertise some of our products oversea, and there will be an increasing necessity to do so. The forthcoming Industrial Exhibition at San Francisco next year, to celebrate the opening of the Panama Canal, is a splendid opportunity of advertising not only South African products, but also South Africa itself. A place that will be visited by probably 20,000,000 people affords an opportunity of advertising a country and its resources that does not occur every year. It is to be hoped that the Government will be able to see their way to make a suitable display on this occasion, with the object of attracting to the country some of that capital so much desired. In the development of the maize industry, for instance, we badly want the enterprise of the American manufacturer. Over £15,000,000 has been expended in South Africa in machinery, plant, land, and buildings, for industrial purposes other than mining, the total invested being nearly £40,000,000. It is questionable if manufacturers are at present getting an adequate return on this sum. With the exception, perhaps, of furniture, South African-made goods are not in evidence in our shops. The merchant is willing to stock them if the public ask for them, so in the last resort it is on the consumer that the responsibility rests. South African industries are no longer insignificant—many of them have attained to large proportions, but it is obvious that the active support of the public is necessary to ensure their continued existence and further development.

THE QUESTION OF PROTECTION.

The Minister of Finance, in his recent Budget speech, assigns two reasons for not encouraging manufactures by means of protective duties. First, that it is highly important not to increase the cost of living, and, secondly, that it would be unwise to stimulate industries which would be carried on by coloured labour at the coast. The South African National Union is not concerned to advocate a political policy of either Protection or Free Trade. But it may be noted that the Minister's last objection cannot apply to protected industries specially. The proportion of coloured to white workers does not depend upon the question whether an industry is protected or not, but upon the nature of the industry itself. If protection is cheaper by coloured labour than by white labour, coloured labour will be employed. The industries which are peculiar to the interior, and which it is highly important for the State to encourage, viz., mining and agriculture, are those which employ the largest proportion of coloured labour. The Minister's objection is, in fact, applicable to nearly all our industries. And with regard to his first point it should perhaps scarcely be taken for granted that protective duties, applied to articles which can be manufactured in the country, would increase the cost of living. Some opinions are that the encouragement of local production is the only means by which the present very high cost of living in South Africa can be materially reduced. At any rate from the examples quoted it would appear that some articles which were affected by the increased duties of 1906 are now, by reason of the stimulus given to local production, cheaper in South Africa than they were then, although in other countries they have become dearer. But in any case there are many anomalies in the customs tariff that requires adjustment, and it is satisfactory to learn that this is to be undertaken. If properly done the increased development of certain local manufactures will become possible, and will certainly follow. There is great need for reliable statistics of the quantity and value of our industrial as well as our agricultural output, and of all the producers in the Union. We have twice attempted to compile a list of the latter, but a complete one will be impossible until producers of all kinds are compelled by law to furnish statistics of production annually. In other countries such information is readily obtainable.

Encouragement of Industries.

Possibly many promising industries capable of establishment in this country do not come into being because of the difficulty of obtaining the necessary funds for the preliminary investigations. It is difficult as a rule to find people inclined to risk such initial expenditure. When ascertained facts are available it is possible to get capital for further investigation, but not so in the early stages. It was thought that the Government could do useful work by investigating up to a point the possibilities of certain industries, by analyses, trial shipments to Europe, experiments in South Africa, reports by experts, etc., etc. We therefore suggested that a small sum, say £1,000 per annum, might be profitably spent in this manner, on our recommendations, but under the control of the Minister. Such a sum, if judiciously spent, would go a long way in ascertaining facts about a number of industries, some probably capable of considerable development. Unfortunately the Minister could not see his way to accept the suggestion. The recommendation is perhaps a somewhat novel one, but in a young country it is not always possible, or desirable, to work on the orthodox lines of older nations. The development of the industrial resources of the country should undoubtedly be fostered and encouraged by the Government to a reasonable extent. In Australia mining operations in the early stages received State aid in various ways, i.e., by loans to miners for prospecting, advances to companies for the development of mining, or by the use of Government testing plants. It would seem possible to extend such a system to industrial schemes, here, which are in as great a need of assistance as mining enterprises, and certainly deserve equal encouragement.

TRANSVAAL CHAMBER OF MINES' MONTHLY REPORT.

Points from the Report of the Executive Committee.

THE quarterly report of the Transvaal Chamber of Mines has the following, *inter alia*:—

The Rand Water Board Supplementary Water Supply Bill, which was referred to in the last report of the Executive Committee, has passed the House of Assembly. The Select Committee appointed by the House of Assembly to enquire into the working of the Miners' Phthisis Act has issued its report, which is under the consideration of the Executive Committee. Prior to the Precious and Base Metals Act, 1908, coming into force, certain diggers' licences in respect of claims such as claims attached to water-rights, and claims which had been converted into diggers' claims for the purpose of having a bond passed over them, were subject to a licence of 15s. per month. After the 1908 Act came into force, the Government held that all such claims must pay licence at the rate of 20s. per month, like ordinary diggers' claims. In the opinion of counsel, this contention is unsound, it being counsel's opinion that the original rate of tax (15s.) is still payable. Steps are being taken to have the matter tested in the courts. A demand was recently made by the Government that the owners of the freehold of ground upon which abandoned mine workings are situate must provide for the protection of such workings. The Executive Committee being satisfied that no such responsibility on the part of the freehold owners exists, agreed to pay the costs of defending an action in support of the demand. The demand has, however, been withdrawn by the Government. The Miners' Phthisis Prevention Committee has been engaged for some time in the sampling of mine air, with a view to determining the amount of dust contained therein. The work is now concluded so far as the Miners' Phthisis Prevention Committee is concerned, but the Executive Committee has decided to continue it. Accordingly a standing sub-committee, consisting of Messrs. Clifford, Lawn and Pill, has been appointed to take charge of the matter, and a suitable staff has been engaged. Inconvenience and additional work has been caused both to the Chamber and to members, through the independent collection of statistics from the mines by various bodies connected with the industry. Arrangements have now been made for the centralisation of the whole of these statistics in the Chamber, and for the collection by the Chamber of all statistics required from the mines by the various bodies connected with the industry. The desirability or otherwise of continuing the flat contract system of payment for underground work on the Witwatersrand has had the earnest consideration of the Executive Committee and the consulting engineers of groups for some months. It has not yet been possible to arrive at a definite decision on the matter, which is still under investigation. The Workmen's Compensation Bill and Industrial Disputes and Trade Unions Bill have been remitted by the House of Assembly to Select Committees of the House. An Ordinance to amend the Local Authorities Rating Ordinance, 1912, was passed by the Provincial Council in May, and provided for the rating of site values. In the opinion of the Executive Committee the Ordinance embodies an unfair differentiation against rateable mining property, inasmuch as such property is rated in respect of improvements, whereas all other rateable property is rated in respect of site value. Representations were made on this point, and also on others connected with the Ordinance. The Ordinance has been reserved for one year by the Governor-General-in-Council. The Government has introduced in the House of Assembly proposals for the taxation of incomes. The Bill as published provides for the exemption from income tax of mining profits which are already subject to tax under the Mining Taxation Act, dividends of companies taxed under that Act being included in the exemptions. The Bill does not, however, provide for any exemption from income tax of the dividends of financial corporations, although such dividends are obtained, to a very large extent, from mining profits. The Executive Committee has made representations to the Government in the matter. Certain minor modifications of the new Customs tariff proposed to be enforced, more especially in regard to the duty on detonators and novel articles of mining material, were suggested by the Executive Committee. The result of these representations is not yet known. At the request of the Dominions Royal Commission, evidence was presented to the Commission on behalf of the Chamber, consisting, to a large extent, of information on the petition of the mining industry on the Witwatersrand. Messrs. Neuhaus, Way and Gemmill appeared before the Commission on behalf of the Chamber. In January, a Commission was appointed by the Government to inquire into and report upon the present method of pauper relief and grants-in-aid to charitable institutions in the Transvaal Province. Evidence has been presented to the Commission on behalf of the Chamber by Mr. H. O'K. Webber. Mr. H. C. Boyd and Mr. George Nathan having resigned their seats on the Executive Committee, the vacancies must, in terms of Article 41 of the Chamber's Constitution, be filled at the ordinary meeting to be held on the 22nd June, 1914. In accordance with that article, Mr. Samuel Evans and Mr. Arthur French were appointed to fill the casual vacancies created by these resignations until such ordinary meeting, and, being nominated, are eligible for re-election at the meeting. The following changes in representation have taken place: Meyer and Charlton G.M. Co., Ltd.—Mr. A. French *vice* Mr. W. H. Betz; Randfontein Central G.M. Co., Ltd.—Mr. J. C. K. Pollock (fifth representative of the company); City Deep, Ltd.—Mr. E. H. Clifford *vice* Mr. B. Madew; Van Ryn Gold Mines Estate, Ltd.—Mr. W. H. Clayden *vice* Mr. J. N. Bulkley; Robinson Deep G.M. Co., Ltd.—Mr. C. Davies *vice* Major C. H. Mullins, V.C., C.M.G.; A. Goerz & Co., Ltd.—Mr. Hans Neuhaus *vice* Mr. M. G. Elkan; Modderfontein Deep Levels, Ltd.—Mr. V. J. Ronketti *vice* Mr. H. Neuhaus; East Rand Proprietary Mines, Ltd.—Mr. W. J. Gau *vice* Sir George Farrar, D.S.O.; Mr. E. Callens *vice* Mr. J. D. H. Lang.

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Rhodesian Section.

LATEST MINING NEWS.

The Giant South Boreholes—The Falcon's Plant—Rhodesian Diamonds—The Golden Kopje—A New Coal Field—The Pickstone.

A CABLEGRAM despatched from the local to the London office of the Giant Mines of Rhodesia, in mail week, reads as follows:—"Giant South No. 6 borehole from 191 ft. to 196 ft. assays ·95 dwts., from 196 ft. to 199½ ft. assays 19·7 dwts., from 199½ ft. to 201 ft. assays 7 dwts."

* * * *

Work on the Somabula diamond fields is proceeding steadily, and the "finds" have somewhat improved of late. The South African Option Syndicate's declaration for the past month was one hundred stones, weighing 137¾ carats, valued at £684 9s. 6d. Some of the stones were very good ones, the largest weighing 18¼ carats and selling for £244, while others which realised good prices weighed 6¼ and 5¾ carats.

* * * *

It is reported from Salisbury that construction work at the Golden Kopje mine is rapidly nearing completion, and that Mr. J. Hynd (chief mechanical engineer to the Rhodesian Goldfields group), passed through to the property the other day. It is hoped that parts of the plant will be under weigh some time during the present month, for testing purposes, and that the trial runs proper will be commenced towards the end of July.

* * * *

Reports to hand from Umvuma speak of great activity at the Falcon mine. Parts of the reduction plant are now being turned round, and the power plant may be said to be practically completed. The first of the trial, or testing, runs will therefore be taking place at an early date. A large number of Australian smelters have arrived on the property and the head metallurgist from the Great Cobar mine has also arrived—to remain in charge of the metallurgical section of the operations. The two light railways—one from Indiva to the company's limestone quarries, and the other to Iron Mine Hill—constructed for the transport of the fluxing material, have already been completed, and are doing duty.

* * * *

The B.S.A. Co.'s Resident Engineer (Mr. A. H. Ackermann), returned last week-end from an expedition to examine and report on certain coal-fields lying about 120 miles to the north-west of Sinoia, and within easy distance of the route of the proposed new railway line from Salisbury to the Kafue. He was accompanied by Mr. Filley, and by Mr. Carlow, the latter being one of the discoverers. It is understood that good coal exists on the new fields, but, while the prospects are really most encouraging, nothing can as yet be said definitely as to quality, width of seams, etc.

* * * *

Mr. W. McD. Stokes, the manager of the Pickstone Gold Mines, in his report to the board of the Pickstone Gold Mines on operations during April writes:—The decreased revenue for the past three months has been due, partly, to the small tonnage crushed, owing to unavoidable stoppages in the mill for want of water, and partly to the fact that recent operations in Pickstone No. 1 East have not continued to give the satisfactory results anticipated from previous development. The water difficulty has now been overcome to a great extent; and I do not attach any great importance to the diminished values in Pickstone No. 1 East, which I look forward to again making as we get deeper, which has been the case with the majority of the mines in Rhodesia in dealing with these lenticular bodies of reef. It is only unfortunate that the values should have diminished just at the time of striking the main ore body of the mine in the new shaft at Pickstone West, and before the latter can be dealt with by the mill. As reported to you in my report for the month of February, the North Lode of the Ironstone body was intersected by the crossent at the 200 ft. level, showing an assay value of 8½ dwts. over 5 ft. Since that date further development work has been done upon the lode, and the assay reports are as undernoted. It should, however, be stated that the ore body is now in the pyritic zone. Owing to the decreased revenue the operations for the month resulted in a loss (including development, £296 10s.) of £572 5s. 11d. The capital expenditure for the month was £265 18s. 1d., all in connection with the new main shaft. For the present all advance development operations will be restricted until the company has recouped itself somewhat for the heavy capital expenditure incurred and paid out of revenue on shaft sinking and in bringing the new plant to its present efficient state.

THE RHODESIA MUSEUM.

Features of the Twelfth Annual Report—A Meritorious Institution.

THE fine building in Bulawayo which houses the valuable collections of the Rhodesia Museum attracted about 3,300 visitors last year, and it is quite certain that as the museum grows with the country an increasing interest will be evinced in this deserving institution by the public. The committee of the Museum have just presented their report for the past year, and in the course of this they remark:—The income from all sources was £1,160 11s. 9d., as compared with £1,202 3s. 4d. in the previous year. This shortage is due to the reduction of the Government grant by £145 and to the fact that interest on the amount of the Transvaal War (Rhodesia) Memorial Fund is now added to the capital amount in lieu of utilising it for current expenses. On the other hand, the commercial branch of the B.S.A. Company is now added to the list of annual grants. The total expenditure was £1,116 15s. 6d., a decrease of £231 6s. 3d. when compared with 1912. Mr. Macgregor, the Museum's Geologist, says in his report:—The Palaeontological Stratigraphical collection has been reduced in extent so as to include only South African forms, since it is felt that the present resources and accommodation of the Museum do not warrant an undertaking so ambitious as the formation of a world-wide collection. Rocks: Our knowledge of Rhodesian schists is not sufficient at the present moment to enable a representative collection of local rocks to be arranged according to any satisfactory system, but the petrological collection arranged by Mr. Mennell two years ago has been retained. The Museum has a large series of ores of gold and of the base metals, the arrangement and labelling of which is in progress, although seriously handicapped for want of cases. It is greatly hoped that some additional accommodation in this line will shortly be forthcoming, since the collection is far from complete, and many important mines are not represented. Additions of various sorts numbered 515. A collection of some 200 mineral specimens, including fine examples of bournonite, jamesonite aragonite, axinite, etc., were presented by Mrs. A. Soutter. Unfortunately, this collection lacked data, the majority of the specimens having no information regarding their origin. Collections of gold ores were received from the following mines: Gaika, Shamva, Wanderer, Globe and Phoenix, and Rezende; it is intended to use the duplicates of these for exchange purposes. The minerals received from dealers, and now incorporated in the collection, include a number of very fine specimens which it is not necessary to enumerate in detail, but particular mention must be made of those of Meteoric iron, Galena, Pyrargyrite, Yttrofluorite, Brookite, Hemimorphite, Rubellite, and Natrochalcite. Specimens of other mineral species new to the Museum are Breithauptite from the Toronto University, and Deweylite from the Premier Mine Museum, Transvaal. Very interesting collections of rocks were loaned by the Geological Survey of Southern Rhodesia, to illustrate their bulletins:—No. 1: A Preliminary Report on the Geology of the District East of Gatooma. No. 2: The Association of Gold Deposits with Acid Igneous Rocks in Rhodesia. The Survey has promised to lend collections regularly to illustrate their bulletins as they are published. Laboratory work during the year has resulted in the determination of a few minerals new to the country, the most interesting of which is a dark blue basic copper phosphate related to the pseudo-malachite group, from the Bwana M'Kubwa Mine, which may perhaps have to be classified as a new species. Being unable for want of apparatus to make a complete examination of the substance, particularly of its optical properties, I sent some specimens to Mr Arthur Hutchinson, M.A., Ph.D., of Cambridge, who very kindly undertook to make an analysis and to read a paper in our joint names before the Mineralogical Society in London. A collecting expedition was made to the Bwana M'Kubwa Mine, in Northern Rhodesia, towards the end of the year, and by the kindness of Mr. J. Cook, the general manager, a large amount of the mineral mentioned above was obtained for further study and exhibition. During a stop of four days on the return journey at Broken Hill, I was able to collect, with Mr. Teagle's permission, several specimens of Parahopeite and other minerals. I have to thank Mr. Hotchkiss and Mr. A. R. Thomson for entertaining me at Kafue and Wankie. At the latter place and at the Victoria Falls a number of geological specimens were obtained. Short collecting expeditions were also made to the Bushtick Mine and to the North border of the Tati Concessions, at both of which places I was kindly entertained and was able to collect much material of geological interest.

Thistle-Etna Gold Mines.

The report of the Thistle-Etna Gold Mines, Ltd., for 1913 states that development on the Faith claims has been very disappointing. During the year the mill ran 291 days, crushing 37,041 tons, or an average of 126 tons per diem, the yield from all processes being 13,847 ozs. and the value £58,457. The total extraction from all sources was 91·4 per cent. Crushing commenced from the Thistle mine in March, 1913, and a fairly good return has been obtained, 6,000 tons going to the mill; but the directors regret to state that the payable ore now appears to be exhausted. While the mill has been kept fully supplied, 37,041 tons of ore being crushed during the year, as against 33,998 tons for 1911, the ore reserves are still 17,434 tons, or practically the same as shown in last year's report.

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THE POSITION OF THE WELGEVONDEN TIN MINE.

Points from the Consulting Engineer's Report.

In the course of his annual report on the Welgevonden Tin Mine, the consulting engineer, Mr. J. I. Jameson, writes:—

Owing to curtailment of development work before milling operations started, and the temporary shortage of native labour for the first few months when milling operations had actually started, the total footage made during the current year is 1,486 feet (35 per cent.) less than last year (4,304 feet). The total average cost of 32s. 5d. per foot for all development work is satisfactory. Further exploratory and development work in depth on the Argil Lode has not met with success. The occurrence at the S. West Workings has improved in values and widths with further development. A small main shaft has been sunk to 100 feet depth to exploit this working. The development and exploratory work at present being undertaken is practically limited to the "S. West" Workings and further exploratory work at the "Far South" Workings. Several new discoveries of promising lodes have been made during the year, but these have not yet been opened out. The total estimated milling tonnage at the 31st December, 1912, was 19,200 short tons, of an average percentage grade of 2·55 per cent. metallic tin. The corresponding figure for the year under review is estimated at 16,230 short tons, of an average percentage grade of 2·0 per cent. metallic tin. During the year 5,107 short tons were milled from September to December, 1913. The reduction in the total ore reserves by approximately 3,000 short tons is accounted for by: (1) The decreased limited amount of development work during the year; (2) the lack of values in depth on the Argil Lode. Owing to the irregularity of these impregnated tin occurrences in felsites and shales, it is practically impossible to gauge the ore reserves and values with any certainty. The true tonnage and value is only apparent when stoping actually takes place. The Argil Lode is a case in point. Although practically fully developed and sampled on the adit level, both calculated tonnages and values for the stopes were found to be incorrect on actual stoping and milling—especially the values, which were considerably lower than was to be expected from the development results. In consequence, the amount of development work proper will be limited in the future. The natural scheme will be to stope out immediately as far as possible any definite chute which is located. Any surplus ore will be dumped at grass. Milling operations were started in September, 1913. The plant was started up without any hitch, and has run very satisfactorily to the prevent date. The power plant, consisting of the two suction gas engines: (1) Tangye "hit and miss" type of 33 b.h.p. (Weynek old engine) driving the stamps, and (2) Campbell four-cylinder, vertical, of 85 b.h.p., have both run very smoothly. The latter engine is particularly economical in charcoal consumption. Owing to temporary shortage of water, the first more or less normal full time running month was November, 1913. During this month the mill ran 27·7 days (over 92 per cent. of full time), and crushed 1,394 short tons of ore. For a light 10-stamp mill the costs are very satisfactory. The total costs (inclusive of all charges) for November, 1913, were 26s. 1d. per ton milled, which figure includes 3s. 6d. for realisation and 2s. 10d. for development. Unfortunately the grade of ore milled was lower than was expected, and the price of Straits tin in London showed a drop of no less than £51 per ton, comparing the prices on the day of sale of the first Welgevonden shipment and the average price for March, 1912 (£163/£214), which facts have naturally adversely affected the profits. Details of the results of milling to the end of the year are given in your manager's report. Owing to the fineness of dissemination of the cassiterite values, and also to the preponderatingly high percentage of heavy iron oxides present in the ore, difficulty has been experienced in immediately obtaining the required percentage of extraction, and also at the same time sufficiently high grade of finished concentrates for the market. After considerable investigation and trials, more satisfactory results have been achieved and both the extraction and grade of concentrates improved. It is expected that further small improvements may be looked for in this respect by the subsequent installation of a calciner and wet magnetic separation. In order to place the present milling requirements on a safe basis, it will be necessary to put down a borehole in the near vicinity of the present pumping station on the Klein Sterk River, so as to provide the necessary water to tide over the dry season each year. Owing to continued drought, this spruit is no longer a perennial stream, as it used to be formerly. This matter is receiving immediate attention. The whole plant, including the power plant, has proved quite successful, and was erected at the comparatively small estimated cost. The estimated crushing capacity per diem of 40 tons has been exceeded, and is about 45 tons per diem. The estimated total mining and milling costs of about 30s. per ton have been more than realised. The average grade of ore has been below expectations up to the present. Also the grade of finished concentrates obtained (owing to iron impurities) has been disappointing. These serious difficulties I hope will be gradually overcome. Recent work, during the past few months, at the S. West Workings, point to the probability of a higher grade of coarser grained ore being obtained from this working—which should materially assist in raising the grade of ore and also the finished concentrates. The prospects of ultimately obtaining additional payable ore from the various new lodes, located during the year, when these bodies are exploited, are distinctly encouraging.

MINING MEN AND MATTERS.

The second annual general meeting of the South African Association of Analytical Chemists will be held at the S.A. School of Mines, Johannesburg, at 8 p.m., on Friday, 19th inst. The report of the Council will be read, and Professor G. H. Stanley, A.R.S.M., F.I.C., will deliver his Presidential address.

* * * *

The list of certificates issued by the Mines Department for the month ended 13th June, 1914, is as follows:—Mine Managers. Metalliferous Mines: C. A. Albu, F. A. Ashe, P. J. L. Bok, W. G. P. Cobbett, D. Gilchrist, F. L. D. Hartley, H. C. Hilton, N. C. Krone, J. H. Veasey, C. O. Wraith. Collieries: J. Jones, J. M. Templeton, W. Wise. Mine Overseers.—Metalliferous Mines: H. J. Dean, T. G. Horne, E. J. A. Kaiser, H. R. Martin, J. V. Muller, E H Nellmapius, H. W. Pureglove, D. Quihampton, A. H. Rice, G. R. Ritchie. Collieries: C. H. Munday. Mechanical Engineers (Mines): A. Nottman, A. Spinnler.

Nigel G.M. Co.

The returns from the Nigel mine for May are as follows: Gold, 4,550 ozs.; profit, £3,367; stamps working, 75; tons milled, 12,700.

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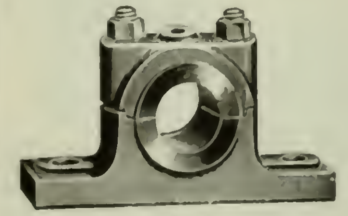

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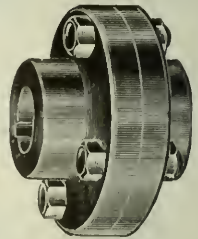

No. 7a.

SIZE IN INCHES.	1 in. s. d.	1½ in. s. d.	2 in. s. d.	2½ in. s. d.	3 in. s. d.
No. 1.—Shafting, Bright Turned, per foot - -	6¼	9	1 2	1 9	2 5½
No. 7a. Flange Couplings, per pair - - -	2 2½	3 0	4 5½	6 4¾	8 6½
No. 70.—Plummer Blocks - - - - - -	5¼	10½	1 6	2 9	4 3¾
No. 3. Plummer Blocks - - - - - -	10½	1 10½	3 4½	6 0	9 6
No. 38. Plummer Blocks, Self-Oiling - - -	1 3¾	2 9¾	5 0¾	9 0	14 3
No. 2b.—Loose Collars - - - - - -	5¼	7¼	9½	1 0½	1 4¾

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Engineering Notes and News.

Some Advice on Accidents.

The *Safety Bulletin* of Nevada Consolidated is continually interesting—chiefly for the comments of the editor on the accidents which occur and which he describes. A few of these from the April number follow:—

John Drakos, a pitman at Copper Flat, was slightly burned by hot cinders thrown by steam shovel fireman who was cleaning his fire in the usual way, a shovelful of cinders striking Drakos, who was passing at the moment. The injured man did not report at the time and the injury might not have been serious if he had not attempted to "doctor" it himself. Infection, due to "dope" and plaster which he put on the burns, caused the loss of nine days' time. Suggestion: By constant repetition we may be able in time to bore through and open up one of the brain cells of these stubborn employees and insert the rule that an injured employee must go to the doctor for treatment. If the injured man in this instance had called at hospital and had his burns properly dressed, he would not have lost his nine days' pay.

J. H. Dever stepped on a strip of wood with a nail in it, upturned. The foreman's report states that "it was only a" slight wound, but Mr. Dever had it attended to by the doctor. Suggestion: That's the way reports should read. Having the wound, however slight, properly attended to. It shows the good judgment of both the injured man and his foreman. Now if the man who left that strip of wood with a nail in it could be found, perhaps the proper emergency treatment for him could be suggested.

George White, mule skinner at Veteran mine underground tramway, suffered a broken rib by trying to get ahead of a train of cars drawn by a mule. He got caught and squeezed between the moving cars and the timbers of the drift. Suggestion: A mule is sometimes a dangerous piece of machinery. Mr. White probably had the right idea—the safe end of a mule is ahead of him. But the loss of time, the expense and suffering which White brings upon himself could have been avoided if he had stopped his train for the few seconds required to pass it.

Mark Bodine, switchman in the dinky train service delivering concentrates from mill to smelter, tried to make a coupling with his foot. He lost four toes and two or three months' wages. The cars in this service are equipped with standard automatic safety couplers, all parts inclosed, with outside trip and lever handle. It is never necessary for a man to go in between cars to make a coupling. Specific rules, with which injured man was familiar, strictly prohibit the dangerous practice of kicking a coupling. His foreman, who had previously been informed that Bodine had been seen kicking a coupling, warned him not to do it again. Suggestion: It is rather discouraging to everybody concerned, after all that has been said and done in practical endeavour to stop this fool practice, to find a man in the employ of the company who still persists, in obstinate, asinine stupidity, in this method of trying to couple cars. The injured man will probably call it "ill-luck," in spite of the fact that he failed to observe an ordinary intelligent rule of safety.

S.A. Institution of Engineers.

The report presented at the annual meeting of the South African Institution of Engineers on Saturday, briefly recorded the work of the past year. It is to be noted that the membership has slightly increased to 582. The gold medal of the institution was awarded to Mr. F. K. Stevens for his paper entitled "Irrigation, with special reference to the future of engineering work in South Africa," while the prize of the Central Mining and Investment Corporation, a prize open to certificated mechanical and electrical engineers, was gained by Mr. G. M. Robertson, of the Kimberley branch of the Institution, for his paper, "Central Power Station Working, with special reference to De Beers Central Power Station." No papers were received in open competition for the Price award. As for the finances, there is a credit balance of £34 12s. 5d. on the year. "While at first glance," say the Council, "it may appear that the financial position of the Institution is not as flourishing as is desirable, your Council have no hesitation in stating that the past year has been a very successful one, and that the finances are in a thoroughly sound and healthy condition. The industrial unrest which has been apparent throughout

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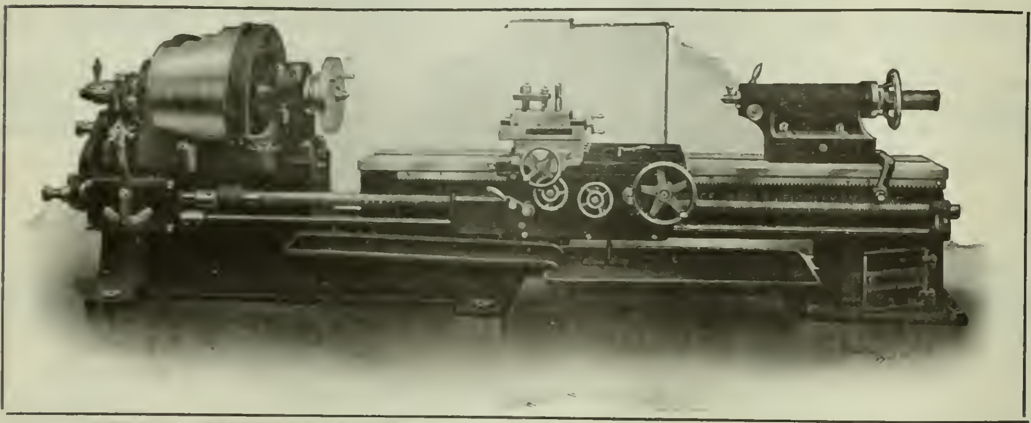

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AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—J. C. Williamson's Co.	8.15
Standard—Rayne Company	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

the year has been severely felt by many members of the Institution, so that the collection of subscriptions has been unsuccessful in many instances. There have also been expenses running into over £100 which must be looked on as extraordinary, and which will not occur again." The capital fund stands at £1,944 2s. 3d. The following papers were read during the year:—"Central Power Station Working, with special reference to De Beers Central Power Station," by G. M. Robertson, associate member, Kimberley branch. "The Buffa Method of Protection against Dangers caused by High Pressure Electric Current Network," by W. Gluckman, associate member. "Air Consumption and Maintenance Costs of Rock Drills," by E. G. Izod and E. J. Laschinger, members. "The Ventilation of Mines," by W. Pile, member. "Notes on Structures," by A. S. Ostreicher, member. "Concentration of Diamondiferous Ground, as applied to the Works of De Beers Consolidated Mines, Ltd.," by J. Stewart, associate member, Kimberley branch. "The Recovery of Bye-Products, the Plant Required, and its Location," by Kenneth Austin, member. "Irrigation, with special reference to the Future of Engineering Work in South Africa," by F. K. Stevens, member. "The Principle of Similarity and its Application in Machine Design," by W. Alexander, member.

PRODUCER GAS ENGINES FOR THE OUTSIDE DISTRICTS.

Speaking on Mr. F. K. Stevens' paper on "Irrigation, with Special Reference to the Future of Engineering Work in South Africa," Mr. J. Braidwood, at a recent meeting of the S.A. Institution of Engineers, said he had made enquiries, and found that the higher cost of bituminous and semi-bituminous producers as compared with those burning anthracite and charcoal and combined anthracite and charcoal had induced some firms to tender for the cheaper anthracite producers to compete against any other firm tendering on the same type of producer. He believed that some plants had been erected which give satisfactory work on a mixture of Natal anthracite and charcoal only, but are not really able to use the anthracite by itself even. This puts the bituminous producer at an unfair disadvantage, and results in purchasers getting the wrong producer, which requires more expensive fuel and will cost more to run, being dependent upon fuel brought from a distance. The mistake is that purchasers accept the lowest tender without obtaining advice from a consulting engineer upon the applicability of the plant to local conditions, its capacity compared with the work required, coal, etc. Producer gas installations are among the most convenient, cheap and reliable sources of power, provided that they are properly installed and attended to. The danger of the steam boiler in inexperienced hands is done away with. The fuel burnt in producers is used to much greater advantage than in the usual small boiler plants to be seen throughout the country. The producer gas engine using local fuel seems to be the nearest approach to the ideal for agricultural purposes. In districts where electrical power is unobtainable at a low price the gas engine, with a properly designed producer to suit local conditions, is a very suitable source of power. It is perfectly easy to generate current with a gas engine and distribute electrical power as required, while the troubles due to water for boiler purposes and their attendant difficulties are non-existent. The quality of the water for gas engines is not of such great importance. It may perhaps be possible in the distant future that Mr. Kenneth Austin's ideas as to the bye-products of coal will be assisted by engine-users making their own sulphate of ammonia. Perhaps, too, the farmers using gas engines will make tar for road construction, so that they will be able to send their produce to market in motor-wagons at about 35 miles an hour instead of three. People in South Africa must discard their old slow methods. They must get the best machinery to work, to know how to work it, and to employ local material as far as possible. The machinery must be reliable and simple to manipulate, so that the person of small intelligence can keep it going in an efficient manner. In the early days of the Rand a consulting engineer was looked upon as a luxury, perhaps in more ways than one. This may account for the fact that farmers and others are slow to realise that the consulting engineer is a real necessity, because he can prevent them from wasting money. The old saying, "every man his own lawyer means a fool for a client,' applies with equal truth to the amateur engineer. All he gets is a quantity of useless machinery to remind him of his folly, such as 30 h.p. turbines with about 10 h.p. of water, a pumping plant, said to be for 10,000 gallons an hour, which will not pump against the head required, and then, owing to under-estimated h.p., will not do more than half the quantity. This kind of thing has been very common in South Africa. For the greater part of it is due to the ignorance of travellers, who have only a catalogue to guide them, and the agents' commission as a compensation for any twinge of conscience they may experience. Naturally this does not apply to plants installed under Irrigation Department loans. These plants are supplied and erected to specification and under supervision of the Department's engineers. This proves the necessity for expert advice when purchasing machinery from non-technical firms. The moral is that machinery should be bought from or through engineers representing engineering firms, and not from merchants dealing in groceries and soft goods. Considerable harm has been done to the sale of machinery to farmers because that machinery has mostly been unsuitable for the work and the cost of working it has frequently been prohibitive. If possible, purchasers of suction gas engines should be assured that, with the exception of lubricating oil, all the accessories for the working of the engines are local products; they would then be brought to look more kindly on a machine which has yet to take its proper place in South Africa. Farmers should, however, be informed that the gas engine is not elastic in limits of overload as is the steam engine. The cut-off cannot be extended to about seven-eighths of the stroke, and thus run about 75 per cent to [illegible] per cent. overload. A little extra money spent on having a margin in producer and engine must not be considered wasted but rather the contrary. The effect of altitude is also an important matter which should be explained. It might be as well to state here that the loss to the purchaser of a gas plant has sometimes been serious on account of getting a cheap and inefficient type of centrifugal pump, which makes the use of a larger engine necessary and increases the fuel consumption, as well as the wear and tear on the plant. Another cause of failure is cheap and faulty erection by incompetent persons. It is therefore advisable that the sellers erect or supervise the erection themselves. It has come to the speaker's knowledge that the Government have accepted a tender for a gas engine and pumping plant, and that, as far as he knew, the plant is to be used for demonstration purposes. The engine is to be 156 b.h.p. at sea level, twin-cylinder, to drive a centrifugal pump of high-lift type to deliver 2,500 gallons per minute against a static head of 68 feet through 2,370 feet of 18 in. pipe. The gas plant must be guaranteed to work on bituminous coal on the following approximate analysis: Moisture not to exceed 4 per cent; volatile matter not less than 23 per cent.; fixed carbon not less than 56 per cent.; ash not more than 14 per cent.; calorific value to be 12·5 lbs. per lb. This only accounts for 97 per cent., so that the difference must be added to the combustible matter, which stands at 79 per cent., say 82 per cent., since 97 per cent. of the combustible (assuming it to be Middelburg coal) would give about 11·85 only. Even after adding the odd 3 per cent. missing to the combustible, we should get about 12·27, which is still under the value required. If it be a Transvaal coal, it must be remembered that most Middelburg coals of 14 per cent. of ash and under are very unlikely to carry more than 1½ per cent. hygroscopic moisture. This gives a difference between 1½ per cent. and 4 per cent., which is 2½ per cent. This, added to the 82 per cent., gives 84½ per cent. of combustible, which should give about 12·65 for a Middelburg district coal. The proximate analysis in the specification seems to resemble very closely the Middelburg coal. Had a proper proximate analysis been included in the specification it would have been easier for our local representatives to know where they stood; but figures were given with the limit in one direction only, either a plus or a minus, and not both, as would have been the case with the average analysis. On the analysis given it is obviously impossible to do more than guess at the class of coal it is proposed to run the producers with. Again, if a coal of another district, having a low ash but of a different nature of coal, is taken, the results for the same proximate analysis would be: 79 per cent. combustible, 11·05 lbs. per lb. approximately; 82 per cent. combustible, 11·47 lbs. per lb. approximately; 84·5 per cent. combustible, 11·83 lbs. per lb. approximately. The more vague the specification the more unfair it is liable to be, also it is likely to result in arbitrations on points which should have been definitely laid down in the specification. In some specifications the principal clause appears to be "to the satisfaction of the purchaser's representative," but there is no mention of what will satisfy him. On the other hand, the contractor has to specify what he will supply. Hence the difficulty in tendering and the large amount of difference in prices supposedly for the same thing. If specifications were always drawn up by consulting engineers with a thorough knowledge of the requirements, tenders would be more easily dealt with and there would be fewer difficulties afterwards. A further extract from the specification reads: "The coal will *if tested* give an efficiency of 12·5 lbs. of water per lb. of fuel under test by and on the standard of the Mahler bomb calorimeter; the fuel will, in other words, be of approximately 12,000 b.t.u.'s." Now the Mahler bomb calorimeter is not a standard in itself, but is standardised on materials such as sugar cane, salicylic acid, benzoic acid, hipuric acid, etc., of a known heat value. Such standard materials are imported from the Standards Bureau of New York with a certificate of their heat value. If, instead of the above, it were stated that the coal should be of any average calorific value of 12·5 per lb. from and at 212° F., the determination of such value to be made on a Mahler bomb calorimeter standardised in accordance with the South Africa Engineering Standards Committee regulations, or have said, standardised on the American Bureau of Standards standard materials, it would have been definite and left no room for quibble or doubt. The proximate analysis in the specification is a misleading

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Royal Automobile Club
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London, 21st April, 1914.

Stelastic Tyres, Ltd.,
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Dear Sirs,

As requested I am returning you the Stelastic Cover which has been running on my car, the distance accomplished being 16,000 miles by speedometer, and at least another 1,000 miles whilst the speedometer was out of order.

Yours faithfully,

(Signed) G. D. DEAN.

NOTE.—This cover is not punctured or burst.

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JOHANNESBURG.

[illegible] since with 10 per cent. of ash, 1 per cent. of moisture and 56 per cent. (the minimum) of fixed carbon, coal of 33 per cent. volatile matter might have to be dealt with. From certain districts in this country such coal might and would have a larger amount of tar than the makers had provided for and yet safely conform with the specification. The most important items, such as gallons of tar per ton of coal at the temperature of producer fires, and the percentage of clinker made, have been left out. Had the writer of the specification wished to afford the tenderers any useful information he would have supplied them with a complete analysis of air dried coal and any other reliable information obtainable. In addition to this information the speaker considered that the manufacturers should be supplied with a quantity of 20 tons or so of the coal to be used in the producer, so that there could be no reasonable excuse for not supplying a proper plant. If successful the plant the Government proposed to erect should be an object-lesson, and the makers should be congratulated, especially if their plant will consume any South African fuel conforming with the specification. He (the speaker) had said little that was new, and was sorry if he had hurt anybody's feelings. If, however, by calling attention to the fact that matters progress slowly and unsatisfactorily in South Africa, and by convincing some people that by taking matters into their own hands, instead of employing an expert, they are doing themselves harm, and undeservedly stigmatising a certain class of machinery as a failure, his time will not have been wasted. If anything can be done to prevent farmers from being imposed upon by ignorant, if not unscrupulous merchants' representatives, progress will have been made. He wished to add that he was closely connected with the coal business, which often involved him having to deal with gas engine matters, but he had no connection whatever with the sale of machinery.

Automobile Club Events.

The annual competition of the Transvaal Automobile Club for the Park Trophy will be held this week-end between Johannesburg and Potchefstroom. The competing cars start from Baragwanath's Hotel on Saturday morning between 10 and 12, to which place they return on the following day between 12 and 3 p.m. Altogether there will be about 150 taking part in the run, and the resources of the Potchefstroom hotels are being taxed to provide accommodation for the party. The annual banquet of the club will be held on Saturday evening at the King's Hotel, Potchefstroom. Among those who will be the guests of the club on that evening are:—General Sir James Wolfe Murray, K.C.B., the Commander-in-Chief to H.M. Forces in South Africa, Lady Wolfe Murray, Brigadier-General Lukin, and the Mayors of Potchefstroom and Johannesburg.

Alcohol as Motor Fuel.

The Alcohol Motor Fuel Committee of the Imperial Motor Transport Council, which was constituted to consider the question of alcohol fuel as a substitute for petrol, has issued a preliminary report. The Committee calls attention to the importance of rendering the British Empire independent of fuel supplies from foreign countries, and points out that crops from which alcohol could be obtained might be cultivated in many parts of the Empire. Mr. A. Stanley, M.P., presided at a luncheon given by the Committee at the Royal Automobile Club in mail week. The Chairman, in explaining the objects of the gathering, said the Alcohol Motor Fuel Committee was set up as a committee of the Imperial Motor Transport Council—a body which came into existence last year, and which comprised representatives and delegates from the Dominions, Colonies, and Dependencies overseas as well as from Great Britain. They aimed at establishing a clearing house of ideas on the subject of motors, the place of which was obviously London. The view was strongly expressed that a committee should be set up to study the question of alcohol fuel. Such fuel was of immense value to the United Kingdom, which now had to draw all its oil fuel from abroad, and of enormous value to some of our colonies, where fuel was difficult to get, but where there was plenty of vegetation. They had reached the stage when they could see pretty clearly what the direction and scope of their investigations ought to be. Ultimately they would have to come to the public for money. The committee was a first rate one, and had no axe to grind. If by means of their experiments anything of value was discovered that information would be given to the public at once. Nobody concerned would get any personal advantage out of it. Their work was to do what was often the work of the Government in other countries, and to carry out pure research for the public.

THE WEEK IN THE SHAREMARKET.

Firmer with Little Increase in Business—Leading Stocks in Better Demand.

Despite the depressing features, business on the Stock Exchange this week has shown an improvement. The passing of the dividends of the Randfontein group and the announcement of temporary suspension of operations at certain tin and diamond mines have naturally had a discouraging effect. None of these occurrences, however, involves any great surprise; and all have, doubtless, already been discounted. Dividends generally are, of course, regarded as highly satisfactory, and as a consequence there has been a notable increase of enquiry in London for leading Rand stocks. Tins and diamonds remain in the doldrums, and the result of the diamond conference will not be published till next month.

* * * *

	Fri., 12th.	Sat., 13th.	Mon., 15th.	Tues. 16th.	Wed., 17th.	Thurs., 18th.
Adair-Ushers	—	0 5*	0 5*	0 5*	0 5*	0 5*
African Farms	11 1*	10 10*	10 9*	10 6*	10 6*	10 1
Apex Mines	17 0*	17 0	16 9*	17 6†	16 6*	16 6*
Aurora Wests	8 9*	8 9*	9 0*	9 0*	9 6	9 6†
Bantjes Consolidated	—	—	—	12 6*	—	—
Blaauwbosch Diamonds	83 0*	—	—	82 0*	—	—
Brakpan Mines	42 6*	42 6*	42 6*	43 3*	42 0*	42 0*
Breyten Collieries	26 0*	26 0*	26 0*	26 0*	26 0*	26 0*
Bushveld Tins	0 6*	0 6*	0 6*	0 6*	0 6*	—
Cassel Coals	—	—	—	—	13 0*	—
City and Suburbans	49 6*	49 6*	50 0*	50 0*	50 0*	51 6
City Deeps	65 0*	66 0	65 6†	64 3*	64 3	64 6*
Cloverfield Mines	4 3*	4 3*	4 0*	4 0*	4 2*	—
Cons. Langlaagtes	34 3†	—	33 9*	33 9*	34 0	33 9*
Cons. Main Reefs	17 6*	17 6*	17 6*	17 6*	17 6*	17 7

*Buyers. †Sellers.

	Fri., 12th.	Sat., 13th.	Mon., 15th.	Tues. 16th.	Wed , 17th.	Thurs., 18th.
Cons. Mines Selection	7 0*	—	—	—	7 0*	—
Coronation Collieries	21 0†	19 0*	—	—	21 0†	—
Coronation Syndicates	—	—	—	2 6*	—	—
Crown Diamonds	2 6*	2 6*	2 6*	2 6	2 6	—
Durban Rood. Deeps	18 0*	17 6*	—	18 0*	18 0*	—
East Rand Centrals	1 9*	1 9*	1 9*	1 9*	1 9*	1 9*
East Rand Coals	1 7*	1 7	1 7*	1 7	1 7*	1 7*
East Rand Deeps	1 6*	1 6	1 5*	1 5*	1 6*	1 6*
East Rand Mining Estates	—	—	2 7*	2 6*	2 6*	—
East Rand Props.	33 0*	33 0*	33 0*	33 0*	34 0†	—
East Rand Debentures	£89*	—	—	£89*	£89*	—
Eastern Gold Mines	—	1 0*	1 0*	1 0*	1 0*	1 0*
Frank Smith Diamonds	2 9	2 6*	2 9*	3 0	3 0*	3 1*
Geduld Props.	24 0	—	23 3*	23 6*	23 6*	23 9*
Geldenhuis Deeps	—	22 6*	—	—	22 0*	24 0*
General Minings	—	—	10 0	—	—	—
Glencoe Collieries	6 0*	6 0*	—	6 0*	—	—
Glynn's Lydenburgs	11 0*	11 6*	11 3*	11 0*	11 3*	11 3*
Goerz & Co.	—	8 6*	—	—	—	—
Government Areas	22 3	21 9*	21 6*	21 6*	22 0*	22 3*
Jhb. Board of Executors	—	—	—	23 6†	23 6†	23 6†
Jumpers	4 0†	4 0†	—	—	—	2 6*
Jupiters	4 6†	4 6†	—	—	—	—
Kaalfontein Diamonds	0 4*	0 3*	0 4*	0 3*	0 3*	0 3*
Klerksdorp Props.	2 8*	2 8	2 8*	2 8	2 8	2 8*
Knight Centrals	7 5	7 4*	7 6	7 6	7 8*	8 0*
Knights Deeps	33 6†	—	33 6†	33 6†	33 6†	—
Lace Props.	3 0*	3 1*	3 1*	3 1*	3 1*	3 1*
Langlaagte Estates	—	—	—	—	20 0*	—
Luipaardsvlei Estates	9 6*	9 6*	9 6*	9 6*	9 3*	9 6*
Lydenburg Farms	—	2 6*	2 6*	—	—	2 7*
Main Reef Wests	7 0*	6 9*	6 9*	6 6*	6 9*	6 10*
Meyer and Charltons	115 0*	115 0*	115 0*	115 0*	115 0*	115 0*
Middelvlei Estates	1 3*	1 3*	1 3*	1 3*	1 4*	1 3*
Modderfontein B.	—	87 0*	—	—	86 9*	87 6*
Modderfontein Deeps	54 9	53 6*	53 9	53 0	53 0*	53 6*
National Bank	—	—	—	—	—	235 0*
New Boksburgs	0 10*	0 10*	0 10*	—	0 10*	—
New Eland Diamonds	—	27 0†	—	—	—	28 0†
New Era Cons.	5 6*	5 6*	5 3*	5 3*	5 3*	5 3*
New Geduld Deeps	1 7*	1 7*	1 6*	—	1 6*	1 6*
New Gochs	14 6*	15 0	15 0*	15 3*	15 0*	—
New Heriots	54 0*	—	54 0*	54 0*	54 0*	54 0*
New Kleinfonteins	22 6*	22 0*	22 0	22 3	22 3*	22 0*
New Modderfonteins	255 0*	256 3*	255 0*	—	255 0*	255 0*
New Rietfonteins	3 3†	2 9*	2 10*	2 11*	2 11*	3 0
New Unifieds	17 0*	17 0*	17 0*	17 0*	17 0*	—
Orange Diamonds	1 1*	1 1*	1 1*	1 1	1 0*	1 0*
Piggs Peak	9 9*	9 9*	9 9*	9 9*	9 9*	9 9*
Pretoria Cements	—	—	—	45 6*	47 0†	46 6†
Princess Estates	5 0*	5 0*	5 6†	5 0*	—	5 6
Rand Collieries	—	—	—	1 0*	1 0*	—
Rand Klips	2 4*	2 4*	2 5	2 4*	2 5	2 4*
Rand Nucleus	1 7*	1 7*	1 7*	1 8*	1 8*	1 8*
Randfontein Deeps	3 7*	3 6*	3 6*	3 6*	3 6*	3 6*
Randfontein Estates	—	—	—	—	—	19 0*
Roberts Victors	—	15 0*	15 0*	15 0*	15 0*	15 0*
Robinson Deeps	—	—	—	—	—	28 3*
Rooiberg Minerals	21 3*	21 0*	21 0*	21 0*	21 0*	21 0
Roodepoort Uniteds	5 0*	—	—	—	—	7 0
Ryan Nigels	2 6*	2 9*	2 6*	2 9*	2 9*	2 9*
Shebas	4 6*	—	4 6*	4 6*	4 6*	—
Simmer Deeps	—	—	1 0*	—	1 0*	—
S.A Breweries	39 0*		39 0*	—	—	—
S.A. Lands	2 6*	2 6*	2 6*	2 6*	2 6*	—
Springs Mines	10 0*	10 0*	10 0*	10 0*	10 0*	10 0*
Sub Nigels	10 6	10 9	10 6	10 3*	10 3*	10 3*
Transvaal Coal Trust	27 0	27 6*	27 0*	—	27 0*	27 [illegible]
Transvaal G.M. Estates	—		—	35 0*	—	37 0
Tudors	2 0†		—	—	—	—
Van Ryn Deeps	45 3*	45 0*	45 0*	45 0*	45 3	45 0
Village Deeps	39 0*	38 9*	38 0*	38 3*	38 9*	39 0*
Village Main Reefs	37 0*	37 0*	37 0*	37 3*	37 6*	37 6*
Vogelstruis Cons. Deeps	0 9*	0 9*	0 9*	0 9*	—	0 9*
West Rand Consolidated	8 3*	8 3*	8 0*	8 0*	8 6*	—
Western Rand Estates	—	1 0*	—	1 10*	—	—
Witbank Collieries	44 0	—	43 6*	—		—
Witwatersrands	71 0*	71 0*	71 0*	—	71 0*	70 0*
Witwatersrand Deeps	51 6*	—	51 0*	51 0	50 6*	49 6*
Wolhuters	14 6	14 3*	14 3	14 3	14 3*	14 3*
Zaaiplaats Tins	24 6	24 0*	23 6*	23 6*	23 0*	23 0*

*Buyers. †Sellers.

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Finance, Commerce, and Industries.

Fruit-Growing Potentialities.

We make no apology for again drawing attention to the possibilities of an enormous industry that stares South Africa in the face and is only awaiting capital and energy to properly develop it and open up avenues for the employment of more white people. In the 1914 report of the South African National Union reference is made to the strides made in agriculture and cattle ranching. There are few schemes, says the report, that present better opportunities for obtaining a sound industrial investment than maize growing and cattle raising. To a great extent this is true, but there will never be that certainty until the Government formulates some definite plan to conserve water in all Provinces of the Union. The large amount contributed by the taxation of the mines towards the State revenue might be expended in well thought-out irrigation works and the conservation of water. We require the guidance and advice of hydraulic engineers of experience. There are great possibilities in certain parts of this country of amassing fortunes in fruit growing. The Low Veld particularly offers splendid opportunities to those possessing a little capital. With its extraordinary fertility and depth of soil it has possibilities in citrus production probably unequalled in any other part of the world. Ground of a similar character in British Columbia, California or Florida would readily fetch as much as £150 per acre. According to some of our leading and practical expert farmers excellent results are obtained by planting orange trees 20 feet apart, equal to 100 to the acre. With depth of soil and sufficient water we are told, by the highest authority in the country, that there are many farmers getting 35s. per annum per tree from orange trees and 60s. per tree from naartje trees five years old. Unimproved land suitable for this particularly profitable class of fruit may be obtained to-day at £3 to £4 per acre. It is only a matter of a few years when probably the same land will fetch £30 to £40 per acre. Let us assume that a retiring miner or commercial man turned his attention to citrus growing and purchased, say, ten acres of good ground. On this plot he could plant 1,000 trees, and, according to the Government Horticulturist, it is common after five years, to get a return of 35s. per tree from oranges, and a larger sum from either naartjes or lemons. Mr. T. B. Bright, of Rustenburg, published in the *Agricultural Journal* that he had realised as much as £4 per tree from lemons. The miner, therefore, would after five or six years be in receipt of a revenue of £1,750 per annum. There is no necessity to worry about local markets, notwithstanding the fact that they pay the grower very handsome profits. But to make "big money" it is undoubtedly wiser to ship the fruit to Europe. This industry awaits the necessary capital, the right soil, water, and the right men, and in seven or eight years would show a return of some millions of money. It is easy and pleasant farming, besides being exceedingly profitable. The budding process can be carried out probably more successfully by women than men and requires only a little commonsense to learn. We quote here from the last report of the South African National Union:—

> "In citrus growing also South Africa possesses an asset the real value of which is not yet grasped. Many districts have been proved to be eminently suitable for the production of citrus fruit. A trade has been opened up and the possibilities of the oversea market tested. South African oranges have obtained a place on the markets of Europe from which, owing to their excellent flavour, and especially the time of the year at which the fruit arrives, they are not likely to be displaced. Moreover, citrus fruit produced in the dry atmosphere of the Transvaal carries well over the 7,000 miles that separate the grower from the oversea consumer. The profits to be derived from orange growing are very considerable. Mr. Davis, the Government Horticulturist, recently instanced cases in which 35s. was being made annually from orange trees and 60s. from naartje trees five years old. The Washington Navel orange is the variety most in favour. Citrus land is rapidly rising in value all over South Africa, but it is still to be had at low prices compared with those prevailing in California and Florida. As irrigation schemes are carried out more extensively, additional areas will become available. There is no pleasanter or more profitable proposition than citrus growing, nor one more suited to the small farmer or the large company who have other sources of revenue while the trees are coming into bearing. In the Transvaal citrus growing and tobacco are often carried on together—the same climatic conditions being favourable to both. Tobacco is a profitable crop at present, but it is expected that the supply will soon overtake the local demand, when oversea markets will have to be sought. But there will always be a considerable market in South Africa for the best qualities of leaf. In the apple-growing sections of Canada and the United States a lucrative proposition is found in the purchasing of large tracts of land and their sub-division into smaller plots suitable for orchards. *These are planted and cared for by the vendors until such time as the trees come into bearing.* The purchase is usually arranged on the instalment system, so that the proprietor of a 20-acre plot, on assuming charge of it when the bearing period arrives, is in a position not only to discharge the remainder of his liabilities within four or five years, but also to live in comfort during that period from the produce of his trees. In British Columbia such ready-made orchards have realised from £80 to £250 per acre. In South Africa it would be possible to offer such propositions to would-be settlers at from £20 to £50 per acre."

Why not apply a similar system under proper supervision in this country?

* * * *

Imperial Cold Storage Co.

Speaking at the annual meeting of the Imperial Cold Storage and Supply Co. this week, Mr. Francis Oats, chairman, said the profits for the year had been diminished because they sold meat in Johannesburg at smaller commission than formerly. Customers had appreciated their action since it had been done without any pressure. They believed that the meat supplies in South Africa were increasing, and with good agriculture, the feeling had developed in South Africa that the time had come when at

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certain seasons of the year the export of meat would probably come into vogue. When such trade developed, the company would get a share of the trade, and in that way, perhaps, would be able to recover large sums spent in buildings at the coast, which at the time were justified owing to the scarcity of meat in the country, and the necessity for storing imported meat in large quantities.

* * * *

Explosives Companies Profits.

In the following table the reports of eight leading explosive-making companies are analysed, the net profits being taken after deduction of depreciation, debenture interest and other prior charges, but before making allowance for special appropriations to reserve, etc.:—

Company.	Net profit. 1913.	Net profit. 1912.	Ord. div. 1913.	Ord. div. 1912.
			%	%
British South African Explosives ...	£68,200	£75,700	7½	7½
Cotton Powder	39,700	a33,800	10	10
Curtis's and Harvey	48,100	38,100	10	7½
"E.C." Powder Company	5,100	8,500	10	15
Eley Brothers	23,400	41,700	11¼	12½
Nobel-Dynamite Trust	381,300	380,700	10	10
Roburite and Ammonal	7,600	7,000	2½	2
Webley and Scott	9,500	7,600	6b	6b

a For eight months only. b On Pref. shares.

Of the big explosives companies the Nobel Dynamite Trust, which is the more representative as it is simply a holding company, and thus reflects the fortunes of several concerns, had only a slightly higher profit than in 1912. There was a decrease of £1,000 in the amount received from subsidiary companies, but this was more than made up for by larger receipts for interest, etc., so that the company, while continuing to pay 10 per cent., is again able to set aside £100,000 to reserve, which will then amount to £800,000. Results might have been better but for the unfortunate accident at the Ardeer works, resulting in the loss of eight lives. The British South Africa Explosives Company also did fairly well. The high price of glycerine caused a large reduction in profits on the company's own business, but to the extent of £8,400 this was counterbalanced by an increase in the net yield from investments.

* * * *

Rhodesian Railways Progress.

In 1911-12 the Rhodesian Railways were severely hampered by the damage to agricultural interests through the severe drought which occurred, and the reports for the year ended 30th September last, which are just to hand, consequently compare with a bad period. Allowing for this, however, the results shown may still be accounted as satisfactory. On the Rhodesia Railways there was an increase in the gross revenue of £6,500, and the result would have been much better but for a shrinkage of £26,400 in passenger earnings, due solely to the reductions in fares which came into operation in April, 1913, and to which the traffic has not yet responded. Unfortunately, the results for the current year so far have not been so satisfactory, the gross revenue for the six months to the end of March showing a falling off of £31,000, while the net earnings were £29,300 lower. Even better results are exhibited by the Mashonaland Railway Company, the gross revenue for the year ended 30th September on the Beira-Salisbury section showing an advance of £122,200 while, as expenditure was only £18,300 higher, there was a gain in net earnings of £103,900. It is pointed out, however, that the increase of £73,200 in revenue from general goods was due principally to the carriage of heavy consignments of machinery imported for the initial equipment of various mines, and must accordingly be regarded as exceptional. As in the case of the Rhodesia Railways, the returns for the current year are not so good, and on the Beira-Salisbury section there is a drop in gross earnings for the six months of £18,400. At the same time expenses are £1,300 up, so that there is a reduction in net earnings of £22,700. The falling off is attributed mainly to a decrease in the volume of construction material carried, and it is plain also that last year's figures were to some extent exceptional.

Gong-Gong and Keiskama.

The following is a statement of diamonds found in the Diamond Proprietary Mines areas during the months of February and March:—February: 379½ carats, valued at £1,481, including stones weighing 11½, 11½, 10¾, and 10¼ carats. March: 518½ carats, valued at £3,001 10s., including stones weighing 49, 34½, 28, 16¼, 13, 10¼, 10, and 9 carats.

Lonely Reef G.M. Co.

The following are the particulars of the output from the Lonely mine for the month of May:—Mill ran 28·33 days, crushed 5,120 tons; yield of fine gold, 1,233·259 ozs.; slimes treated, 5,120 tons; yield of fine gold, 2,824·176 ozs.; value of mill gold, £5,184 4s. 1d.; value of slimes gold, £11,874 1s. 2d.; total recovery of fine gold, 4,057·435 ozs.; total value, £17,058 5s. 3d.; estimated profit, £9,000.

General Mining & Finance Corporation,

LIMITED.

(Incorporated in the Transvaal)

P.O. Box 1242.

General Mining Buildings,
Johannesburg,
15th May, 1914.

NOTICE IS HEREBY GIVEN that the Fourteenth Ordinary General Meeting of Shareholders of the General Mining and Finance Corporation, Limited, will be held in the Board Room, General Mining Buildings, Johannesburg, **on Friday, the 26th day of June, 1914, at 11 a.m.,** for the following purposes:—

1. To receive and consider the Balance Sheet and Profit and Loss Account, and the Directors' and Auditor's Reports for the year ended 31st December, 1913.
2. To elect Directors in place of Messrs. Martin Luebeck and Paul Thomas, who retire in terms of the Articles of Association, but who are eligible, and offer themselves for re-election.
3. To appoint an Auditor or Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors.
4. To transact any other business which ought to be transacted at an Ordinary General Meeting.

The Share Transfer Books of the Corporation will be closed as follows:—

(a) At the Head Office from the 22nd of June to the 10th of July, 1914, both days inclusive.

(b) In London from the 25th of May to the 30th of May, 1914, both days inclusive.

Holders of Share Warrants to Bearer desiring to be present or represented at the Meeting should deposit their Shares at the places and within the times following:—

Johannesburg:—At the Head Office of the Corporation, General Mining Buildings, at least three days before the time appointed for the holding of the Meeting; or

London:—At the London Office (Transfer Department), Winchester House, Old Broad Street, E.C.;

Berlin:—At the Berlin Office, 43, Markgrafenstrasse; at the Dresdner Bank, Behrenstrasse, 38 39; at the Direction der Disconto-Gesellschaft, Behrenstrasse, 43/44; at the firm of S. Bleichroeder, Behrenstrasse, 63; at the A. Schaaffhausen'scher Bankverein, Behrentrasse, 21 22;

Paris:—At the Paris Office, 29, Rue Taitbout; at the Bank de l'Union Parisienne, 7, Rue Chauchat;

Basle:—At the Schweizerische Bankverein;

Zurich:—At the Schweizerische Kreditanstalt;

At least thirty days before the date appointed for the holding of the Meeting.

By Order of the Board,

H. W. DALTON, Secretary.

New Kleinfontein Company, Limited.

(Incorporated in the Transvaal.)

SPECIAL GENERAL MEETING.

NOTICE IS HEREBY GIVEN that a Special General Meeting of the Shareholders of the above-named Company will be held in the Board Room, Fourth Floor, National Bank Buildings, Simmonds Street, Johannesburg, **on Tuesday, the 21st day of July, 1914, at Eleven o'clock in the Forenoon,** for the purpose of considering, and, if thought fit, resolving (with or without any modifications or alterations which may be adopted at the Meeting):—

1. To increase the nominal Capital of the Company from £1,151,540 to £1,300,000 by the creation of 148,460 new shares of a nominal value of £1 sterling each, 115,154 of which shares shall be offered to Shareholders for subscription pro rata to their registered holdings in the Company as at the 30th June, 1914, in the ratio of one new share for every ten held, at the price of 20s. in cash per share.

   In the event of the transfer of the properties of the Apex and Benoni Companies, which were purchased under the recent amalgamation for shares in this Company, not being completed by the 30th June, 1914, the Shareholders of these Companies will be offered such pro rata proportion of the new issue as they would be entitled to subscribe for by virtue of the shares accruing to them as the purchase price of their respective properties.

The issue has been guaranteed subject to a commission of 5 per cent., payable in fully paid shares of the Company.

The Guarantee contains a stipulation that it is to become void should the making up price of Rand Mines, Limited, shares for the end of July Account be under £5 5s.

The new shares will rank for Dividend in like manner with the other shares of the Company issued at the respective dates of their allotment, except as regards any dividend which may previous to allotment have been declared.

Any balances not taken up and paid for by the Shareholders above-mentioned shall be issued to the Guarantors of the issue or their nominees at the price of 20s. per share.

All shares representing fractional interests shall be allotted to and taken up by the Guarantors or their nominees at the price of 20s. per share.

2. To authorise the Directors to fix all other terms and conditions upon which the said issue is to be made, and to provide that any Shareholder as above-mentioned failing to comply with such conditions shall not be entitled to participate in the subscription; and for the closing of the Share Registers and depositing of Bearer Shares, and generally to settle and carry out all the details of the scheme to confirm the payment of a commission to the Guarantors of 1s. per share upon the whole amount of capital now offered for subscription, which commission will be paid to them in shares in the Company, taken at par, and issued to the Guarantors or their nominees as fully paid up.
3. To authorise the Directors to take all steps necessary to register and record the said increase of Capital, and to issue the shares in accordance with the Resolutions taken at the Meeting.

The following Directors and Shareholders of the Company are interested as Guarantors or representatives of Guarantors in the [illegible] as stated above:—

Messrs. Wm. Dalrymple and Edw. H. Reed in their capacities as Managing Director and Manager in South Africa of the Anglo-French Exploration Company, Limited.

Mr. W. [illegible] in his capacity as representative of Sir George Farrar.

Mr. A. R. Gill in his capacity as representative of Messrs. S. Neumann and Co.

Mr. J. H. [illegible] in his capacity as representative of Sir Abe Bailey.

Mr. G. C. Fitzpatrick in his capacity as representative of Mr. Julius [illegible].

Mr. Edward Wagg in his capacity as a member of the London Committee of the Company.

Sir George Farrar and Messrs. William Ross and H. O'Kelly Webber are interested individually as Guarantors.

The Share Transfer Registers will be closed from the 1st July to the 21st July, 1914, both days inclusive.

Holders of Share Warrants to Bearer who desire to participate in this issue if carried out, must lodge their Warrants between the 22nd of June, 1914, and 7th July, 1914, [illegible] at the Head Office, Third Floor, National Bank Buildings, Simmonds Street, Johannesburg, or at the London Office, 208-224, Salisbury House, Finsbury Circus, or with the "Credit Mobilier Francais," 30-32, Rue Taitbout, Paris.

Holders of Share Warrants to Bearer who desire to be present or represented at the Meeting must produce their Warrants at the places and within the times stated below:—

At the Head Office, Third Floor, National Bank Buildings, Simmonds Street, Johannesburg, at least 24 hours before the Meeting;

At the London Office, 208-224, Salisbury House, Finsbury Circus, or with the "Credit Mobilier Francais," 30-32, Rue Taitbout, Paris, up to 26th day of June, 1914.

By Order of the Board,

L. S. RAYMOND, Secretary.

3rd Floor, National Bank Buildings,
Simmonds Street, Johannesburg.
P.O. Box 1364, 19th June, 1914.

28580

The Langlaagte Estate and Gold Mining COMPANY, LIMITED.

(Incorporated in the Transvaal.)

DIVIDEND No. 48.

DECLARATION OF INTERIM DIVIDEND.

NOTICE IS HEREBY GIVEN that an Interim Dividend of Five per cent. 1s. per share) has been declared for the six months ending 30th June, 1914, payable to Shareholders registered on that date. Dividend Warrants will be posted to South African Shareholders from the Head Transfer Office, P.O. Box 1040, Johannesburg, and to European Shareholders from the London Transfer Agency, 30-31, St. Swithin's Lane, London, E.C., on or about the 10th August, 1914.

DIVIDEND ON BEARER SHARES—COUPON No. 37.

Holders of Share Warrants to Bearer are hereby notified that they will receive payment of the Dividend on presentation of Coupon No. 37, which is payable at the London Transfer Agency, as above, or negotiable with their Paris Correspondents, Messrs. Clark and Hattensaur, 46, Rue de Provence, Paris, on or about the 10th August, 1914.

Coupons must be left four clear days for examination.

The Transfer Books will be closed from the 1st to the 7th July, 1914, both days inclusive.

By Order,

J. H. TILEY, Transfer Secretary.

Head Transfer Office,
Box 1040, Johannesburg
June 19th, 1914.

28567

The Natal Navigation Collieries and Estate Co., Ltd.

NOTICE OF DIVIDEND No. 23.

SHAREHOLDERS ARE HEREBY NOTIFIED that the Directors have declared a dividend of Three and Three-quarters per cent. (Ninepence per Share) for the half year ending June 30th, 1914, payable to all Shareholders registered as such in the Company's Books on the 30th June, 1914.

Dividend Warrants will be issued as soon as possible after receipt of returns from London Office.

The Transfer Books of the Company will be closed from July 1st to 7th, both days inclusive.

By Order of the Board,

J. T. JONES, Secretary.

Natal Bank Chambers,
Durban, 17th June, 1914.

THE SOUTH AFRICAN

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CONTENTS.

PAGE

Notes and News 465

Topics of the Week:
  Should Our Tin Mines Close Down? 467
  Tuberculosis and Miners' Phthisis 468

The Half-Year's Dividends 469
The Coal Industry of the Union 470
Rand Recovery Value Calculations 470
Manager and Staff of the Spring Mines, Ltd. 471
"Welfare Work" on the Main Reef 472
South African Association of Analytical Chemists ... 474
Law Reports Affecting Mining 475
The Standardisation of Mine Accounts 476

Rhodesian Section:
  Latest Mining News 477

Engineering Notes and News 479
  Coal Mine Rescue Stations 480
Finance, Commerce and Industries 481
The Week in the Sharemarket 483
Company Meetings: Robinson Deep: African Land and Investment Co. ... ... i.

Notes and News.

Development Footages in May. Not only were the gold mines of the Transvaal able to declare substantially larger outputs and to record better profits in May than in preceding months, but in addition development was more actively prosecuted, largely on account of the improved position in regard to native labour. On the Witwatersrand the amount of development work carried out last month was 38,994 feet in main drives and crosscuts, 2,425 feet in main shaft sinking, and 22,993 feet of other development. There were in use 6,012 rock drills along the Main Reef series. In regard to the gold mines of the Transvaal as a whole the amount of development carried out was 49,872 feet, as compared with 2,818 feet in April, 2,818 feet of main shaft sinking as against 2,846 in the preceding month, and "other development," 6,127 feet, as compared with 5,929 feet. The rock drills in use were, in May, 6,127, and in April, 5,929. From these figures it will be evident that development is keeping pace with crushing and that the ore reserves are not being allowed to be reduced on account of tons mined.

* * * *

Oil Shale Flotations in South Africa. Activity in regard to the flotation of oil and oil shale properties continues. Two new Madagascar concerns—the Folakara and Betsiriry Oil Companies have recently been referred to in the columns of this journal, and we now learn that at least two companies have either been floated or are in course of flotation to acquire and work oil shale properties in the Union. One such company has, we believe, been formed with a capital of £400,000. It appears that the two principal concerns now engaged in the acquisition and exploitation of oil shale areas in South Africa are the Consolidated Oil Fields of South Africa and the Cape-Cairo Development Company. Both these concerns are understood to be engaged in the formation of subsidiaries—the former in connection with a property in the Utrecht district, which has been examined and reported on by Messrs. Cunninghame Craig and J. E. Mills Davies, and the latter in regard to a property situated about fifty miles to the east of Nottingham Road, in Natal. No doubt something more will be heard of these ventures in the near future.

* * * *

The Refractory Ores Company. An extraordinary general meeting of the New Refractory Ores, Ltd., was held on the 18th inst. at the Grand National, Mr. W. Holman James being in the chair. A large number of shareholders were present. The following gentlemen were elected on the board of directors: Dr. Murray, Col. Hutchinson, and W. Holman James, with power to add two to their number. After the Chairman had opened the meeting, Mr. J. R. Williams gave an interesting outline of the progress of the company's process, and pointed out that some valuable information had been obtained. He also said the Chairman (the patentee) had done valuable work for the company. The Chairman stated that although the work of erecting the new plant may appear to be slow, still it was essential to be sure even at the expense of time, but he hoped to get the one-ton plant ready by the end of the month. A vote of appreciation was passed to Mr. J. R. Williams for his valuable assistance and the interest he is taking in the matter.

* * * *

The New Kleinfontein Issue. In publishing the cable sent to its London office by the New Kleinfontein Company last week, a printer's error occurred in the figures given. The cash assets not immediately realisable at December 31st last should have been £43,000, and not £3,000 as stated; and the amount set aside for Benoni Consolidated was £62,000, not £52,000 as printed. The figures were, however, reported correctly elsewhere in the paragraph.

Messina (Transvaal) Development.

Mr. C. I. H. Leslie (Chairman of the Kyshtim Corporation, Ltd) has been elected a director of the Messina (Transvaal) Development, Company, and has been appointed Chairman; Mr. H. C. Hoover has also been elected a director. The official announcement adds that the other two directors are Mr. John P. Grenfell and Mr. R. J. Frecheville. Hitherto Mr. A. M. Grenfell has been Chairman. Cables regarding the finances of the Messina Company appeared in the daily Press last week, and confirmation is awaited with interest.

* * * *

New Transvaal Gold Farms.

Presiding over the twelfth ordinary general meeting of the New Transvaal Gold Farms, Ltd., Mr. D. Symons said the board had to congratulate the shareholders on having had a most successful year, as evidenced by a dividend of 10 per cent. The company now held as much land as at any time of its existence, and it had been and still is its policy to reinvest the capital realised from farms sold in other farms whenever a favourable opportunity presented itself. In consequence of the board having decided to have as many farms as possible visited by one of the members, he had visited the extensive area owned by the company in the Maclear district, some 19,000 morgen. On a conservative estimate he valued the 19,000 morgen of land at a price beyond the capitalisation of the company at the present market rate of the shares. This was independent of the 65,000 morgen freehold and 5,000 morgen over which the company had mineral rights. Since the closing of the accounts for the past year the board had disposed of two farms in the Maclear district, the profits on which would materially assist towards paying a dividend for the ensuing year.

* * * *

Tin and Copper Production in the Union.

Statistics issued by the Mines Department of the Union in respect of the month of May show that in so far as base metal production was concerned the sales and shipments had a total value of £151,953, the export of copper ore being 5,319 tons of a value of £125,816, and of tin 322·7 tons, value £26,137. In regard to copper, the Transvaal produced 1,126 tons of 40·07 per cent. metal, and the Cape 1,176 tons of 48·43 per cent. metal. Sales and shipments were: Transvaal, 1,410 tons, value £30,181; Cape, 3,909 tons, value £95,635. The output of tin in the Transvaal was 364·76 tons, containing 65·76 per cent. of pure metal and in the Cape 12·6 tons of 72 per cent. value. The sales and shipments of Transvaal tin were 319·7 tons, value £25,956. This compares with £37,353 in April and £34,492 in March, and is, in fact, in point of value the smallest export recorded for several months past. The tonnage, however, is substantially greater than in August of last year, when the value of the shipment was £35,600. The decline in value is, of course, attributable to the marked fall in the price of tin, which appears to be seriously affecting the fortunes of South African properties in common with cassiterite properties in other parts of the world. In this connection it is to be observed that the Swaziland Tin Company's directors have decided to pass the dividend on account of the unsatisfactory price at present obtaining for the metal.

* * * *

The Phthisis Board.

Despite the protests of all concerned, including the Chamber of Mines and the Mine Managers' Association, the doings of the Miners' Phthisis Board remain, like Jeames's parentage, "wropt in mystery." Over and over again before the recent Select Committee on the working of the Phthisis Act at Capetown, representatives of the mining industry voiced its legitimate claim to be furnished with particulars of the cases compensated by the Board. At the Chamber of Mines' meeting on Monday last, Mr. E. A. Wallers, the President, also entered a dignified protest against these methods of secrecy, and there is a growing body of evidence to the effect that grave scandals are being perpetrated in connection with the awarding of compensation. If Mr. R. A. Barry is able from his experience at the Nourse Mines to adduce four instances of mistakes being made, it is logical to conclude that the whole Rand is proportionately affected. It is but natural that the medical men concerned are not over-desirous of having their mistakes advertised, and their attitude in the matter is, of course, purely passive. The fact is that the mine managers must keep hammering away at the matter till the Government comes to recognise the need for reform. There must be the fullest publicity in regard to the beneficiaries under the Phthisis Act; and there must be specialization in regard to the examination of cases. The great need on the medical side of the industry to-day is specialization. In mining science the "guessers" and "bluffers" have long ago been found out on these fields. In medical science the "know-alls" and the mere general practitioners must be content to give way, in regard to special diseases, to those who have devoted their lives to a special study of those diseases. In this connection, it may be pointed out that the page of statistics vouchsafed to us for the past two months by the Phthisis Board is meaningless and of no value. All the facts that would make the tables of use are omitted, and in the absence of comparative figures those now published indicate little and are worth less. As it is, the tables as printed are a jumble of uninformative futilities, and are mere dust in the eyes of the public.

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Village Main Reef Report.

The results for 1913 of the Village Main Reef Gold Mining Company compare unfavourably with those of 1912, the more so as the average yield of the last-named period was swollen to the extent of about 1s. per ton by inclusion of the gold reserve; but the effects of decline in grade were greatly accentuated by a shrinkage of 34,000 tons in the quantity of ore milled, due to the decrease in the native labour force. Nevertheless, the net profit rather more than covered the 70 per cent. dividends, making the fifth year in succession for which this amount has been paid. An interim distribution at the same rate is now recommended. The drop of 3s. 6d. per ton in yield is stated to be "caused by the gradual exhaustion of the richer stope faces." Even last year the yield per ton apparently exceeded by over 3s. per ton the assay value of the ore reserves; but, after allowing for the very considerable percentage of sorting—nearly 17—this is not really the case. We contrast the results of the past three financial periods:—

	£ 1913.	£ 1912.	£ 1911.
Gross receipts	819,892	959,396	910,518
Expenses and taxes	488,301	516,220	506,320
Net profit	331,591	443,176	404,197
Dividends	330,400	330.400	330,400
Brought forward	377,240	264.464	190,667
Carried forward	378,430	377,240	264,464
Ore crushed (tons)	435.980	470,056	476,250
Yield per ton	36/0	39/6	37/4
Cost per ton	18/7	18/7	18/0
Profit per ton	17/5	20/11	19/4
Ore reserves (tons)	1,166,145	1,683,066	1,418,754
Average value	32/9	33/7	8·5 dwt.

Apart from winzing, the development of the mine is now completed, except as regards two small areas estimated to contain some 350,000 tons. This, with the ore reserves, is stated by the consulting engineer to indicate a life of a little over three years on the basis of a milling output of 10,000 tons per month. In the event of the company being unable to mill to full capacity, the period will, of course, be correspondingly extended. Maintenance of half-yearly dividends of 7s. per share during the remaining two and a-half years can scarcely be expected. Let us assume that the dividends of the three years will total 35s. To this falls to be added the cash and investments. Last year the directors purchased a further 27,650 Village Deep shares, bringing the total up to 115,000. These shares, with some other investments, figure in the balance sheet for £203,400, the value of the quoted securities on 31st December being £188,600. Adding the cash—practically £300,000—and deducting the liabilities we arrive at a surplus of £210,000, equal to rather over 10s. per share.

New Industrial Legislation. The Miners' Phthisis Act Amendment Bill, which was read a first time in the Assembly last week follows the main recommendations of the Select Committee's Report, such as (1) increased amounts of compensation, (2) limitation of medical re-examination. Clause five gives the Board power to make awards out of the compensation fund of not exceeding £100 to beneficiaries or dependents, but with the proviso that they must be permanently resident within the Union and in need of assistance. Power is given to make awards to dependents of persons who died of miners' phthisis prior to the 1911 Act coming into operation; while clause seven makes special provisions regarding native labourers. The date of the commencement of the Act is set at August 1, 1914. The Industrial Disputes Bill, as amended by the Select Committee, is also published. It has been considerably altered, principally by the omission of sentences and clauses. The clause dealing with the constitution of the Conciliation Boards is very much simplified. Chapter four, regarding offences in relation to strikes and lock-outs, is limited by the insertion of a new clause relating to the mining industry and public utility services. The definition of "trade union" is somewhat altered, principally by the omission of the sentence excluding Government servants. Chapter six, under the heading general and miscellaneous, contains four new clauses dealing with the question of employment during strikes. One lays it down that persons are not to be prejudiced for refusing to accept employment where a dispute exists. Another empowers the establishment of an Advisory Committee for the management of labour bureaux, which are required to give information of the existence of a dispute to any applicant for employment in the locality; while another empowers the Minister to make provision for ballots during the continuance of a strike. The definition of "employer" is amended to mean a person or body employing at least two (instead of five) employees, other than members of his or their own family, but excludes Government departments.

* * * *

New Legislation and the Industry. At the quarterly meeting of the Chamber of Mines this week, the President dealt with the new legislation in its application to the mining industry. "Under the Industrial Disputes Bill," he said, "it will be possible for a standing Conciliation Board to be appointed in respect to the mining industry. That Board would deal with matters likely to cause industrial disputes between employers and employees. The provisions of the Bill are largely of an optional character, and depend for their effect on the co-operation of all parties concerned; and thought it might appear from the recent report of the Secretary for Mines and Industries that the directors of mining companies have little consideration for their employees, I should like to say here emphatically that such is not the case. I would add also that the directors of the Witwatersrand gold mines are always ready to do everything that can reasonably be expected of them to improve the well-being and conditions of service of their employees. A comparison of conditions prevailing on the gold mines here with those in other mining districts would, I think, substantiate that statement. There has recently been considerable criticism on the system of work in regard to underground contractors on these fields, and many of the troubles with underground employees have been ascribed to its existence. The Secretary for Mines and Industries referred to the matter at some length in his report, which has recently been issued, and you will remember that the Economic Commission definitely recommended the abolition of the flat contract system that is largely in vogue, and suggested the substitution of either an ordinary day's pay or a day's pay plus a bonus, dependent on the amount of work done. I would add, however, that unless such a bonus was carefully restricted the effect of a system of payment on a day's pay plus bonus would be very similar in actual operation to the flat contract system The Chamber is at present obtaining very complete statistics showing to what extent the various systems of underground work are in vogue in the fields, and their relative efficiency. As you are aware, the matter is one that presents considerable difficulty in its settlement, and it is continuing to receive very careful investigation."

TOPICS OF THE WEEK.

SHOULD OUR TIN MINES CLOSE DOWN ?

The extraordinary fall in the price of tin cannot but be the cause of deep concern to all interested in South African mining. So serious is the effect of that drop upon the profits of the mines in the Union that there is a growing volume of opinion among those mainly concerned in favour of the temporary closing down of all our tin mines until such time as the market for the metal recovers. In recent issues we traced the downward trend of tin prices and printed elaborate statistics showing how production had outrun consumption, scattering and scaring the "bulls" in the metal market out of their confidence. The result has lately been brought home to us all by the effect on the tin mines of the Union. Welgevonden has temporarily suspended operations. Mines on the margin of profit-earning have gone under altogether. The Swaziland Tin people have passed their dividend, and it is an open secret that Groenfontein and Leeuwpoort are putting the brake on production. The question before the industry now is, Shall all the mines close down until their product commands a better price? Plainly, there is a great deal to be said for such a step, drastic as it may, at first glance, seem. Let us consider the matter from the point of view of those chiefly and most directly interested, viz., shareholders, the tin market, and the men on the mines. It is not difficult to see that shareholders have everything to gain and nothing to lose from the adoption of the proposal. Certainly it could hardly lower the present quotation for their shares. As a fact, it would have so good an effect on the tin market generally that it would probably increase rather than diminish the price of the shares. It could not affect dividends any more than they have already been affected, and the contingent loss to shareholders consequent on the step is therefore, on the whole, negligible. On the other hand, the gain to them would be direct and tangible. The tin market would be strengthened by the withdrawal of the South African supply at a time of critical weakness and over-supply, and the resources of our mines would be conserved in the fullest sense of the term by not being "dumped" on a waterlogged metal market. In England, in America, even in this country lately in connection with the Voorspoed Diamond Mine, we have heard much of the advantages of "conserving natural resources," and it would be easy to show that a policy of temporary suspension of production—for development, of course, could be carried on—at our tin mines would be in the highest and best interests alike of the State, the mine-owners or shareholders, and the market. In regard to the last-named, the objection will doubtless be advanced that the South African contribution to the total world-supply is a small and unimportant factor. Without attempting to dispute that fact, it may be pointed out that the moral effect of the step could not fail to be great. The mere fact that the tin mining companies were in such a strong financial position as to be able to face with equanimity the trying and indefinite business of awaiting a better market would obviously have an excellent effect all round. It would strengthen the credit of our tin mining companies, and it would strengthen the hands of those who are fighting the now unequal combat to maintain the price of the metal. Remains the question of those employed in the several divisions of the industry. Their position, we confess, has intrigued us considerably. Fortunately, their number is not so great, nor their qualifications so specialized that their energies could not temporarily be profitably employed by the other great branches of the mining industry in the country. Fortunately, also, the control of the tin mines, though not perhaps directly vested in any of the gold mining houses, is closely allied with those houses, and the latter would, doubtless, exercise themselves to provide temporary employment for those affected by the step. We do not profess to exhaust here all the arguments for and against the proposal that may present themselves in the course of the protracted consideration that it undoubtedly deserves. But we have indicated a few. Few as they are, however, they seem to warrant full and close enquiry by those responsible for the management of our tin industry. Into tin mining as into diamond mining, the market factor enters very appreciably, and we see illustrated every day the fact that eternal vigilance, constant study, adaptability, and resourcefulness are requisite to the successful conduct of the business of diamond production. And like it, but unlike gold mining, tin mining demands an ever-present finger on the pulse of the market, and a quick perception of the "schemes and stratagems" essential to the marketing of the product to the best advantage. This moment in the tin market is, therefore, emphatically one for hard thinking and prompt action. The leaders of the tin industry need not fear that their motives will be misunderstood. The position of our chief tin mines is inherently sound, and in nearly every case shareholders are familiar—owing to the admirable policy of publicity pursued—with the ore reserves and prospects of their properties. Nor would they think any the less of the directors of the tin companies if they found them quick to gauge a situation, and to take a far-seeing, if drastic, step to provide against all contingencies. At any rate, this brief and cursory review of some of the pros and cons of the question can do no harm. The issues are vital to our tin industry, and gather public interest daily. In the interests of the State, the shareholders and all whose future is bound up with the tin industry of South Africa, is it too much to ask that the suggestion herein put forward should be given serious consideration?

TUBERCULOSIS AND MINERS' PHTHISIS

In the speech made by Mr. E. A. Wallers at the quarterly meeting of the Chamber of Mines on Monday, there was a deeply significant passage dealing with the connection between tuberculosis and miners' phthisis. Mr. Wallers said: "It is a question worthy of serious consideration whether the large number of claimants under the Miners' Phthisis Act is not primarily due to the existence of tuberculosis among mine employees and not to the existence of silicosis. The whole question of the bearing of tuberculosis on the prevalence of miners' phthisis is, I think, one that should be thoroughly investigated by the industry, and I trust by the Government. The amending Bill which has just been received definitely lays down that all natives are to be medically examined every six months." As a fact, evidence accumulates daily that the part played by tuberculosis in the mines of the Rand has hitherto been underestimated. The testimony of medical witnesses before the Select Committee on the Phthisis Act is unanimous on that point. In this connection, it is noteworthy that in a Report (1906) of an Investigation at Bendigo into miners' phthisis, Dr. Walter Summons stated that it had not been possible to determine death rates in age groups as no records existed, but the figures available "clearly show the enormous increase in the deaths amongst miners from pulmonary disease, notably tuberculosis. The number of deaths amongst miners from tuberculosis is at present six times as great as amongst adult males in Victoria generally. This affords ample evidence of the detrimental conditions under which quartz mining is carried on. Also, while the prevalence of the disease is diminishing amongst the general population the number of miners affected is rapidly increasing." "The majority of miners affected died in the prime of life." In 1911 a Royal Commission reported on lung diseases amongst miners in Queensland and on the expediency of excluding persons affected by tuberculosis from mines. They emphasised the necessity of drawing a sharp distinction between pulmonary fibrosis received from the inhalation of sharp dust and the results of subsequent infection by the bacilli of tuberculosis or other living agency of specific lung disease. "Pulmonary fibrosis," they stated, "is a mechanically-produced disease purely local in its origin and of relatively little direct import so far as risk to life is concerned. It remains local unless or until pulmonary tuberculosis is implanted upon it, with its resultant poisonous effect upon the general system and destruction of the lung tissues. . . . The risk to life lies in infection by the organisms of tuberculosis." "Pulmonary tuberculosis appears to be a relatively frequent cause of death amongst Queensland metalliferous miners. It apparently displays a special predilection to attack those who are already the subjects of pulmonary fibrosis. The deaths ascribed to miners' phthisis are, we consider, almost invariably due to pulmonary tuberculosis, with or without an antecedent pulmonary fibrosis. The actual infection in any given case is more likely to have been contracted in the above-ground environment than at work. The relative frequency of pulmonary tuberculosis among Queensland metalliferous miners is not, we consider, excessive at present, when compared with conditions amongst miners elsewhere. . . . From what has gone before it will be evident that the control of tubercular pulmonary diseases amongst miners is largely a question of combating tuberculosis amongst the general population. . . . For these reasons, we are of opinion that an organised campaign against pulmonary tuberculosis will require to be undertaken by the State before the death rate amongst miners from this disease can be materially reduced. In 1911 a Royal Commission enquired into the subject of miners' lung diseases in Western Australia and reported in November of that year. "The suppression of tuberculosis among miners," they said, "should be the first aim of the Government and of all persons interested in the mining industry. This involves, to begin with, an unhesitated expulsion of tuberculosis individuals from working in or about mines. Such a measure, in the interests of the welfare of the community, involves suitable provision for the included persons and their dependents. Our Commission deals only with miners, but it must be pointed out that no measures applied to miners alone will safeguard them or the community at large. Unless similar measures be applied to the general population they must of necessity be futile, and had better not be undertaken. No group of men can be effectively protected from tuberculosis as long as it is surrounded by an unprotected community." The Commissioners insist "that concerted action with the object of stamping out tuberculosis is worth the most strenuous effort, pecuniarily and otherwise." And they recommend that "whenever and wherever persons employed in or about mines are discovered to be suffering from tuberculosis they be forthwith excluded from their occupation, and they and their dependents shall be provided for by the State, in the interests of the community." The Commissioners submit detailed recommendations as regards "the expulsion of tuberculosis sufferers from working in or on mines." They urge that provision be made for examining all applicants for mine work "within three months of the passing of the Act" and for a half-yearly examination of all persons "employed in or on a mine." The Commissioners state that if tuberculosis were dealt with in the manner indicated by them the danger arising from miners' phthisis would be unimportant. The application of all this to the Rand is plain; and though Commissions have become a byeword in this country, we can unhesitatingly support Mr. Waller's suggestion in this instance. One essential reservation, however, must be made. The problem of tuberculosis as it affects miners' phthisis on the Rand can only be solved by experts; and no Commission composed of other than European specialists in tuberculosis can be trusted to do justice to the investigation. The one fact that emerges from the evidence before the Select Committee on Phthisis is that the sooner that investigation is undertaken the better.

THE HALF YEAR'S DIVIDENDS.

Declarations Announced to Date—What Transvaal Gold Mines Are Distributing.

As two or three important companies which are expected to announce dividends in respect of operations for the past six months have not yet declared their distributions, we are unable to give in this issue a full and complete list of the half-year's dividends. This will be found in our next issue. We here give particulars of declarations received up to the time of going to press:—

Company.	Issued Capital.	Date of Declaration.	Rate per Cent.	Rate per Share.	Amount.	Total Distribution for Year to Date.	Amount Half Year, June, 1913.	Amount Half Year, Dec., 1913.
THE RAND.								
CENTRAL MINING AND INVESTMENT CORPORATION.								
Bantjes Consolidated ...	£502,306	June	2½	6d.	£12,557	£12,557	£25,115	£12,557
City Deep	1,250,000	June	11¼	2s. 3d.	140,625	140,625	125,000	93,750
Crown Mines	940,106	June	55	5s. 6d.	517,058	517,058	517,058	517,058
Durban Roodepoort Deep..	440,000	June	3¾	9d.	16,500	16,500	22,000	—
Ferreira Deep	980,000	March	25	5s.	245,000	245,000	245,000	245,000
Geldenhuis Deep	585,753	June	8¾	1s. 9d.	51,253	51,253	58,575	43,932
New Modder	1,400,000	June	15	12s.	210,000	210,000	210,000	210,000
Nourse Mines	827,821	June	8¾	1s. 9d.	72,434	72,434	68,985	82,782
Modderfontein B.	700,000	June	25	5s.	175,000	175,000	140,000	175,000
Robinson	2,750,000	June	9	9s.	247,500	247,500	220,000	192,500
Rose Deep	700,000	June	20	4s.	140,000	140,000	175,000	122,500
Village Deep	1,060,671	June	10	2s.	106,067	106,067	106,067	53,033
Village Main Reef	472,000	June	35	7s.	165,200	165,200	165,200	165,200
S. NEUMANN & CO.								
Consolidated Main Reef ...	924,364	June	5	1s.	46,218	46,218	46,218	46,218
Wit. Deep	550,000	June	15	3s.	82,500	82,500	82,500	110,000
Wolhuter	860,000	April	6¼	1s. 3d.	53,750	53,750	53,750	32,500
ANGLO-FRENCH EXPLORATION.								
New Kleinfontein	1,054,540	June	5	1s.	52,727	52,727	—	72,750
GENERAL MINING AND FINANCE CORPORATION.								
Meyer and Charlton	200,000	June	35	7s.	70,000	70,000	60,000	80,000
Van Ryn	500,000	June	22½	4s. 6d.	112,500	112,500	125,000	112,500
CONSOLIDATED MINES SELECTION.								
Brakpan Mines	750,000	June	12½	2s. 6d.	93,750	93,750	150,000	93,750
ROBINSON GROUP.								
Langlaagte Estate	886,500	June	5	1s.	44,325	44,325	66,487	22,162
JOHANNESBURG CONSOLIDATED INVESTMENT COMPANY.								
Consolidated Langlaagte ...	950,000	June	10	2s.	95,000	95,000	—	95,000
Ginsberg	210,000	June	10	2s.	21,000	21,000	36,750	36,750
New Primrose	325,000	June	20	4s.	65,000	65,000	97,500	97,500
New Unified	250,000	June	10	2s.	25,000	25,000	25,000	25,000
Van Ryn Deep	1,196,892	June	12½	2s. 6d.	149,611	149,611	—	89,767
Witwatersrand	469,625	June	25	5s.	117,406	117,406	117,406	117,406
INDEPENDENT COMPANIES.								
Durban Roodepoort	125,000	May	10	2s.	12,500	12,500	12,500	18,750
OUTSIDE DISTRICTS.								
Glynn's Lydenburg	170,000	Jan.	10	2s.	17,000	17,000	17,000	—
Sheba	269,738	Feb.	5	1s.	13,487	26,973	33,718	13,487
	269,738	June	5	1s.	13,487			
Transvaal G.M. Estates ...	604,225	April	17½	3s. 6d.	105,739	105,739	120,815	120,815

The Income Tax Debate.

The Income Tax Bill, as altered by the adoption of Mr. Jagger's amendment, still leaves the shareholders in the mines on the Rand and in De Beers Company unaffected, though such part of a man's income as may be derived from those shares counts towards the income tax. The latter remain unaffected under Clause (c) of Section 5, which says: "Income received or accrued as dividends from any company which is liable in the Union under Act No. 6 of 1910 to the tax on profits of mining" is exempt. It is true that a further clause provides that income from dividends which pay profit tax become liable, if the profits tax is less than the applicable income tax rate would be; in which case the said income becomes liable to contribute to the Treasury the difference between the income tax and the profits tax. But this provision does not affect mines, which pay 10 per cent., while the higher income tax rate is 1s. 6d. in the £.

THE COAL INDUSTRY OF THE UNION.

Figures for the Four Provinces—Highest Total Value for Several Months Past.

The coal output of the Union last month was 773,457 tons of a value of £204,265, the highest value that has been recorded for several months past. To this total, the Transvaal contributed £101,516, the Cape £2,633, the Orange Free State £16,907, and Natal £83,209. The outstanding features of production for these four Provinces were as under:—

	No. of Collieries.	Tons Mined.	Percentage of Waste Sorted out.	Tons Sold.	Value per Ton. s.	Value per Ton. d.
Transvaal ..	29	522,177	11·14	457,091	4	5·30
Cape	9	5,945	21·35	4,581	11	5·94
O. F. S. ...	5	68,691	7·32	61,139	5	6·37
Natal	20	332,140	23·99	250,646	6	7·67
Union of S.A.	63	928,953	—	773,457	—	

In regard to the Transvaal the output figures according to districts were:—

Province.	No. of Collieries Producing.	Mined. Tons.	Waste Sorted. Tons.	Percentage of Waste Sorted to Tons Mined. %
Springs-Brakpan Area	4	48,239	14,207	29·45
Middelburg Area ...	15	406,172	41,070	10·11
Other Areas	10	67,766	2,917	4·30

Province.	Total Coal Sold. Tons.	Total Value Realised at Pit's Mouth. £	Value per Ton at Pit's Mouth. s.	Value per Ton at Pit's Mouth. d.
Springs-Brakpan Area ...	33,641	8,379	4	11·78
Middelburg Area	360,416	80,143	4	5·37
Other Areas	63,034	12,994	4	1·47

The selling value per ton of Transvaal coal, it may be observed, remains at the low figure of under 4s. 6d., and considering its quality the coal of the Transvaal at anything around its present price may be considered the best value in coal on earth. Despite the continued low selling price efforts are being made to bring other pits into the productive arena, and we understand that two or three coal properties are at present in the market for flotation. In conclusion, it should be of interest to give figures as to production in the four Provinces since the commencement of Union. The returns are:—

Period.	Union of South Africa. Tons Sold.	Union of South Africa. Value at Pit's Mouth.
June to December, 1910 ...	4,160,755	£1,123,549
Year, 1911	7,594,944	1,935,153
Year, 1912	8,117,078	1,999,378
Year, 1913	8,801,216	2,240,458
1913—June	753,926	190,159
July	775,770	197,078
August	720,228	183,119
September	733,081	185,659
October	746,608	189,675
November	685,734	171,317
December	757,396	190,194
1914—January	657,945	174,971
February	695,415	183,660
March	725,143	190,575
April	731,668	193,946
May	773,457	204,265

RAND RECOVERY VALUE CALCULATIONS.

A Remarkable Blunder in a Technical Contemporary.

The *Mining Magazine*, of London, long since proved itself to be an admirable publication in many ways, but after the manner in which it has lectured directors, engineers, the Press, and in fact everybody on the principles of mining one cannot refrain from smiling at a paragraph on recovery value as applied to the ore reserve of a Rand mine appearing on page 345 of the May issue. The paragraph in question states:—

"Recovery-value, as applied to the ore reserve of a Rand mine, does not mean the recovery that will be obtained from the ore reserve by itself, but from it when mixed with ore from sources not taken into account in the ore-reserve statement. In other words, a mine never draws all its milling ore from its ore reserve, and in calculating the recovery value of a mine as a whole the amount and value of the ore derived from every contributory source must be taken into account. It is therefore necessary to give due weight to the effect exercised by the additional ore from development faces, stripping, reclamation, and surface dumps. To illustrate the incidence of the various factors a simple generalized calculation is here given, it being assumed that the mine under discussion has an ore reserve of a stoping value of 7·0 dwt. and a sorting ratio of 10%.

Contributory proportion		Value dwt.		Ton dwt.
80 tons from ore reserve	@	7·0	=	560·0
7 ,, ,, development	@	3·5	=	24·5
13 ,, ,, other sources	@	5·0	=	65·0
100 ,, to sorting station	@	5·73	=	572·5
10 ,, of waste sorted out	@	0·00	=	0·0
90 ,, sent to mill	@	6·37	=	572·5

95% metallurgical extraction on 6·37 dwt. = 6,05 dwt = 25s. 5d.

So that a mine possessing a profitable ore reserve of 7·0 dwt. stoping-value and sorting 10% may be expected to show a recovery-value of 25s. 5d. per ton crushed. Taking other sorting-ratios of 5%, 15% and 20%, the recovery-value works out at 25s. 4d., 28s. 4d., and 30s. 1d. respectively per ton crushed."

These calculations are, to say the least of it, amazing, and we candidly confess that we are quite unable to follow them. As a matter of fact, they are quite wrong. 80 tons from ore reserve at 7 dwts., 7 tons from development at 3·5 dwts., and 13 tons from other sources at 5 dwts. give 100 tons to the sorting station of 6·49 dwts. per ton value. Making allowances for the elimination of 10 per cent. of waste, the assay value of the 90 tons sent to the mill is 7·21 dwts., and on a metallurgical extraction of 95 per cent. this means 6·85 dwts., or 29s. 1d. per ton. The *Mining Magazine's* figures are wrong to the extent of 3s. 8d. per ton, and it might be pointed out that 3s. 8d. per ton is a very big margin on the Rand. In fact much less than that may mean a vital difference on a big mine.

Manicaland Output.

The mineral output of the territory of the Companhia de Moçambique (Manicaland) for the month of May, 1914, is as follows:—Reef: Mill: Gold won (fine), 539 ozs. 19 dwts. 19 grs.; tons crushed, 1,149; value, £2,267 16s. 6d. Concentrates (estimated): Gold (fine), 13 ozs. 7 dwts. 10 grs.; tons, 6; value, £56 16s. 6d.; also contains silver and lead, value £19 16s. 8d. Cyanide: Gold recovered (fine), 73 ozs. 18 dwts. 19 grs.; tons treated, 1,058; value, £310 10s. 6d. Alluvial: Gold recovered (fine), 856 ozs. 17 dwts. 19 grs.; cubic metres treated, 80,000; value, £3,598 17s. 11d.

THE MANAGER AND STAFF OF THE SPRINGS MINES, LTD.

Top row (standing): S. N. Brigden (Compound Clerk), H. D. Ridley (Shop Foreman), J. A. Smith (Storekeeper), A. S. Gillespie (Paymaster), F. Hewitt (Foreman Blacksmith).
Second row: W. W. Ramsay (Timekeeper), M. Sinclair (Foreman Carpenter), T. Dobinson (Electrician), J. R. Robinson (Assayer and Sampler), E. W. Granger (Compound Manager).
Seated: S. Moore (Mine Captain), Wm. C. Smyly (Secretary), B. D. Bushell (Manager), J. Scott (Engineer), T. T. Nichol (Mine Captain).
Olliver, Photo.

Lewis & Marks' Farms Open to Prospectors.

It is notified in the *Government Gazette* that, under and by virtue of the powers vested in him by sub-sections (1) (*c*) and (2) of Section 10 of the Precious and Base Metals Act, 1908, of the Transvaal (Act No. 35 of 1908), the Minister of Mines and Industries has approved of certain private unproclaimed farms and portions of farms, the property of The African and European Investment Company, Ltd., situate in the mining districts of Pietersburg and Ottoshoop, Transvaal Province, being open to the public for prospecting for precious metals on and after the 20th day of June. Subject to the provisions of Chapter I., Part II., of the Act, prospecting for precious metals under the authority of a prospecting permit may be carried on on and after the said 20th day of June, 1914. It is further notified that The African and European Investment Company, Ltd., have notified their intention that the prospector who, in the course of prospecting, makes a discovery of base metals on any of the aforesaid farms, shall be entitled to a discovery right subject to the terms and conditions published under Government Notice No. 318 of 1912 in the *Union Gazette* of the 5th March, 1912, as amended by Government Notice No. 1378 of 1912, published in the *Union Gazette* of the 11th October, 1912, with respect to farms of the Transvaal Consolidated Land and Exploration Company, Ltd., thrown open to prospecting. Copies of the tributing agreement, which will be entered into between the African and European Investment Company, Ltd., and the prospector, in respect of the discovery right, may be seen at the company's offices, Lewis & Marks' Buildings, Johannesburg, the offices of the respective Mining Commissioners, and at the office of the Minister of Mines and Industries, Pretoria.

Potchefstroom Exploration Co.

At the annual meeting of the Potchefstroom Exploration Gold Mining and Estate Co., Ltd., the Chairman read the following report of the directors:—Gentlemen, your directors beg to submit to you herewith the audited statements of accounts for the year ended March 31, 1914, and to report as follows: The property of the company remains unaltered, and comprises (a) Welgegund No. 84, 8,293 morgen 497 square roods, freehold; (b) portion of Syferkuil No. 328, 1,944 morgen 200 square roods, freehold; (c) Droogegrond or Stukgrond No. 692, 1,203 morgen 547 square roods, freehold. During the year the company's farms have been let for agricultural purposes, subject to certain conditions for a period of five years. The rentals for the first two years amount to £200 per annum, and thereafter to £300 per annum. The revenue for the year as shown in the accounts was £722, and the expenditure £550. The directors retiring at this meeting are Messrs. J. A. Cohen and E. Friedlander, who are eligible, and offer themselves, for re-election. The retiring auditor is Mr. H. J. Lamb, whose services are again available to the company.

"WELFARE WORK" ON THE MAIN REEF.

What Rand Companies Are Doing for Employees—Health Benefits and Recreative Facilities—The Mines and Housing Schemes—Heavy Contributions to the Phthisis Fund.

I.—"CORNER HOUSE" SUBSIDIARIES AND THE "SQUARE DEAL."

A YEAR or two ago this journal published a series of articles on the activities of the controlling mining houses of the Witwatersrand in regard to the health, housing, comfort and recreative opportunities of the employees. Those articles engaged so much attention that we are now tempted to return to a consideration of these aspects of industrial life along the Main Reef series, the more especially so because a great deal more has been achieved since those articles were published. The last year or two has indeed witnessed many important developments in regard to what our American cousins term "the square deal," a phrase which bears the obvious interpretation of "playing the game with your workmen." Only a most prejudiced critic could argue that the mines have not "played the game" with their employees during the past few years. Doubtless many will smile at the suggestion, just as attempts to deliver straight talks to miners in the form of public lectures by the much-maligned controllers of the industry have been scoffed at, and as the City Deep's housing scheme was sneered at in some circles.

ENORMOUS EXPENDITURE.

But the broad fact remains that in the past few years vast sums of money have been expended on workmen's quarters, recreation halls, swimming baths, golf links, libraries, billiard rooms, gardens, etc., right along the reef. And at the same time supreme efforts have been directed towards the improvement of underground ventilation, dust allaying, sanitation, and the reduction of sickness and accident rates. The visit of Surgeon-General Gorgas to the Rand at the invitation of the Transvaal Chamber of Mines, the installation of large ventilating fans underground, the initiation and prosecution of the "Safety First" campaign, and the erection of comfortable quarters and excellent recreation halls, etc., are each and all symptomatic of the earnest desire of the mine owners to better the welfare of the workers. Admittedly the directors of Rand mining companies have not been guided solely by philanthropic motives in this "square deal" policy. The mine owners make no secret of the fact that they fully admit that it is sought to benefit the ends of shareholders as well as of workers. It is admitted that more contented workmen mean better results. But that should in no way detract from the fact that the greatest credit is due to boards of directors for the very thorough manner in which this work has been carried out. Probably nowhere else in the industrial world are the principles of social service better understood or more liberally practised than on these gold fields, and if the consequences of the labours of the mines in these directions are not always as good as have been expected the fault lies more with the men themselves than with the employers.

THE MINES GIVE THE LEAD.

It is during the past few years that this crusade in favour of the welfare of employees has been taken in hand in a markedly vigorous form. But it should not be overlooked that for the past dozen years the mines have been labouring hard in this direction. The problem of the miners' personal claims was taken in hand as soon after the war as circumstances would permit, and one of the first results of this enterprise was the improvement of miners' quarters and the planning of industrial villages, both carried out with no niggardly hand, and with the assistance of the best available architectural experience. The development of the housing scheme, particularly under the direction of the boards of the Eckstein group, was not long in progress before comfortable and cheerful homes, with proper sanitary provision, were everywhere in evidence; other groups were no less active in carrying out similar improvements, until to-day the standard of artisan dwelling accommodation considered necessary by the mining houses may be said, unhesitatingly, to be in itself adequate and well devised, and, generally, to be equalled by few in any other part of the world and excelled probably by none. The process of betterment in this respect has not ceased, but is still active wherever the means of carrying it out are at hand, and invariably in those places where additional housing room has to be provided. It is noteworthy that the Government has thus far shown very little disposition to benefit the lot of the mine employee, particularly in the important direction of ownership of land and homes by the workers. It was left to the mining houses to formulate a scheme whereby miners could become possessed of all those real advantages which attach to the ownership of a home and even a modest portion of land—and in this, as in other humane and elevating endeavours, the Eckstein group, represented by Mr. Raymond W. Schumacher, has taken a decided and vigorous lead. Mr. Schumacher has, in fact, identified himself with the small ownership movement to an extent that assures success, if success is possible. It is difficult to say at this early stage of the proceedings how beneficial and widespread the results of the scheme are likely to be. If other circumstances prove as favourable as the hope to make them so is genuine and earnest, the advantages to the individual miner, the industry, and the State may well be incalculable.

MR. EVANS AND CO-OPERATIVE SCHEMES.

It is difficult to see in what other directions than those so far discussed in this article the leaders of the mining industry can strive to ameliorate the living conditions of the miner. That they can be improved still further, however, is a matter which requires little demonstration to those who, like the miners themselves, find their lines cast in the Transvaal. The cost of living is another and quite a different problem from that of the way of living, although it has no small amount of bearing upon it. It is a problem that awaits solution at the hands of the Government. In his noteworthy speech delivered at the annual meeting of the Crown Mines a week or two ago, Mr. Evans touched on this point. *Inter alia*, he said: "Where the European employees and their families on our mine have, I think, reasonable ground for complaint is in directions which are beyond the control of the company. . . . Mine employees are prohibited by law from establishing their own co-operative stores. Last year the Mining Commissioner stopped the Crown Mines Club from selling to their members soap, bootlaces, toilet requisites, etc. This was done at the instigation of the Transvaal Mine Traders' Association, whose members have a monopoly of trading on mining areas, and who, in the main, cater for the European worker. . . . From every point of view the establishment of a well-organised scheme of co-operation among the Europeans on the mines would be beneficial. It would tend to substantially reduce the cost of living; it would improve the health conditions as it would enable food stuffs to be handled more carefully and with less exposure to flies, dust and other means of contamination than is the case under existing conditions, and it would undoubtedly lead to the greater use of local agricultural produce in place of imported foodstuffs. The Crown Mines offers ideal railway facilities for the distribution of agricultural produce, as truck loads can be taken from any station in the Transvaal direct to practically any point on the property. In fact, it ought to be possible for people living on the Crown Mines to be supplied with agricultural produce of all sorts cheaper than is the case with the working classes in England. It is largely a question of the efficiency of the distributive agencies. This applies particularly to flour, bread, meat, cheese, butter, milk, fruit and vegetables."

What the Corner House Mines Did Last Year.

And now a few facts and figures as to what was done by some of the mines of one group alone in the "square deal" movement last year should prove of interest. Firstly, as to the Crown Mines no better view of the admirable social and recreative lines upon which this great property has been laid out can be presented than that portrayed by Mr. S. Evans in his notable speech. Mr. Evans said: "I have already pointed out that we are spending money ungrudgingly to ameliorate the lot of the miner and to make the conditions under which he works satisfactory, and the fact that miners from abroad who have been here once return again is conclusive evidence that as regards the state of things underground these mines compare favourably with those of Australia and other countries. I wish to add a few words as to the position on the surface. We have provided housing accommodation for 296 married men and 435 single men. The rents charged are much lower than in the town and its suburbs and are as low as the rents which prevail in the United States, Canada and Australia for similar accommodation. For the benefit of the single men there have been established at convenient points staff messes, co-operative messes, and boarding houses. We have on the property a large sports ground for cricket and football; an 18-hole golf course, nine tennis courts, a rifle range, a swimming bath, a boat house and boats on the Booysen Reservoir, while a bowling green is being provided. We have also five recreation halls, containing libraries, reading rooms, billiard tables, and two large concert halls. All the aforementioned are managed by committees chosen by the employees themselves. I doubt if there are mining communities in any other country who are as well off so far as the pay, the housing, means of recreation and the amenities of life generally are concerned."

City Deep, Rose Deep, Village Deep, and Modder B.

In connection with the City Deep it should be noted that the manager, Mr. P. W. Sherwell, in his annual report, lays emphasis on the fact that "everything possible is being done to improve health and working conditions underground for white and coloured employees." That labours in this direction have borne good results is shown by the fact that there was further improvement in the health of the mine natives last year, the average number in hospital for sickness being 0·6 per cent. as against 0·9 per cent. in 1912. There was also a considerable reduction in admission to hospital owing to minor accidents. Above ground the most important welfare work achieved was in regard to the building of homes for employees. The initial portion of this housing scheme was completed during the year; 40 houses being erected. The Village Deep participated in this scheme to the extent of 6 houses. The homes in question and the exceedingly favourable terms upon which they can be acquired by workers on the City Deep have already been described in the columns of this journal. One often hears the City Deep spoken of as an unpopular mine. It is true that some time ago employees were constantly leaving and going to other properties, but that there has been great change in the feelings of workers towards the mine and its administration cannot be doubted, and to describe the mine as unpopular to-day would certainly not be true. One unerring indication that this is so is the fact that the percentage of underground changes in the last three months of 1913 was 11·3 per cent. as compared with 21·6 per cent. for the first three months of the year. In December last the figure was reduced to under 10 per cent.

At the Rose Deep dust-allaying arrangements were improved last year, and every effort is being made to render the atmosphere of the mine as free from dust as possible. Large quantities of water are used for spraying and washing down faces, while a solution of molasses is sprayed in the drives, which it keeps in a moist condition for long periods. A new European change house with accommodation for 120 men was completed during the year. The Village Deep Company spent £3,719 on participation in the adjoining City Deep's housing scheme for employees. At the Modderfontein B., which is one of the most prettily-situated properties on the Reef and has aptly been termed the Garden Mine, the work of further improving the already excellent living conditions was continued, and additional married quarters costing £8,685 were erected. There were also built a recreation hall at a cost of £3,583, and a white employees hospital at a cost of £2,000.

The Question of Phthisis.

We propose supplementing these details with a few figures regarding the contributions to the Miners' Phthisis Compensation Fund and donations to the upkeep of the Miners' Phthisis Sanatorium. It may be argued that in so far as the Phthisis Compensation Fund is concerned that this is taxation imposed by the State and that no tittle of commendation of the policy of the controlling houses is called for here. This is in a degree true, but at the same time the attitude and spirit of the Mines in regard to legislation which has imposed an exceptionally heavy burden on the industry is worthy of remark. This attitude was, we think, well presented by Mr. M. A. Braunstein, who, presiding at the meeting of the Village Main Reef Gold Mining Company, Ltd., a fortnight ago, said the result of the Miners' Phthisis Act was eminently satisfactory. The disease had at last been checked, if not removed. He emphasised that the death-rate among whites in Johannesburg compared favourably with the death-rate in London. They paid heavily for these satisfactory health conditions, he said, but they did not begrudge a penny. In point of fact, the legislative action which has been taken with the object of providing for those who have become victims of the disease and those who may in the future succumb to its attacks, has met with the solid support of the leaders of the mining industry upon every point at which their sympathy could reasonably have been looked for. In only one respect, that of the apportionment of liability, did they feel called upon to make a protest.

Contributions of Corner House Mines.

For those "Eckstein mines," which recently held their annual meetings, the total assessments and donations in respect of phthisis were as follows:—

	Assessment under Miners' Phthisis Act, 1912, in respect of Compensation Fund.			Donations (including Contributions to Running Expenses of Phthisis Sanatorium).		
Crown Mines	£31,183	4	6	£1,917	1	0
City Deep	8,819	11	3	445	13	4
Rose Deep	12,736	15	2	646	1	5
Village Deep	13,160	13	10	554	18	11
Geldenhuis Deep	15,023	0	8	493	5	1
Modder B.	4,371	9	3	574	19	10
Durban Roodepoort Deep	6,323	6	7	251	11	1
Bantjes Consolidated ...	6,633	11	7	144	5	9

The total assessment for these mines thus amounts to the large figure of £98,252, and donations to £5,027, or a total of £103,279 for eight mines. We propose in our next issue to deal with the mines under the control of other groups in regard to recent welfare work.

Premier Diamonds.

The Premier Diamond Mining Company has declared a dividend of 200 per cent. (5s. per share) on deferred shares for the period ending the 30th of June.

Glynn's Lydenburg.

During the quarter ended the 30th April, 446 feet were driven on prospecting drives at the Glynn's Lydenburg, but the results were not encouraging. Water troubles were met with in the werf mynpacht, and very little payable reef was discovered in No. 2 west drive. Features of the quarter were the following:—Tons crushed, 11,129; total yield, 5,711 fine ounces; value per ton milled, 43s. 2d.; working costs, 18s. 7d.; working profit, £13,687; working profit per ton, 24s. 7d.

SOUTH AFRICAN ASSOCIATION OF ANALYTICAL CHEMISTS.

Presidential Address by Professor G. H. Stanley, A.R.S.M., F.I.C.—Full Report.

My first duty to-night is to express my high appreciation of the honour which has been done me in electing me President of this Association, and I am only echoing my predecessor when I say that my year of office will always be a happy remembrance. The position has one grave drawback, in that it is incumbent upon the holder to deliver a Presidential address. The preparation of this is no light task in any case, and more especially so is the present in view of the very high standard set by Dr. McCrae last year, and it is therefore with considerable diffidence that I address you to-night. The report of the Council shows but a small addition to the membership during the past year, and is so far satisfactory. One reason, and I think a very probable one, has been advanced, and is mentioned in the report, but I consider that this state of affairs also affords evidence that there is still a lot more spade work to be done both by and for the Association before our profession in South Africa can be considered as being upon a satisfactory footing. Nevertheless, we require very few additional members to have enrolled over half of the qualified analysts of the Union, and are not therefore, I think, claiming too much when we speak on behalf of the profession as a whole, more especially as quite a number of those who, for various reasons, have not yet entered the Association, have expressed their sympathy with our aims and objects. The work of the Association, to be done by present members, is for them to strenuously urge its claims upon their professional friends, pointing out why they should join and how they can help. Bacon, I think, said that every man is a debtor to his profession—a dictum which cannot be too strongly insisted upon, and one way in which that debt may be partially discharged is by joining such an Association as ours and helping to further its objects. The work to be done by the Association as a body is sufficiently varied and important to amply justify its existence, and it may perhaps be useful to elaborate our objects somewhat as stated concisely in the constitution. Such a survey of the ground to be covered may help waverers to join and assist in our efforts towards the advancement of our profession. Our chief object is to uphold the status and interests of the profession; but in this connection one of the most outstanding features of the position as between the public and the professional chemist is the real ignorance on the part of the former of the nature of the occupation, capabilities or qualifications of the latter. This was extremely well exemplified recently in the attitude taken by the Department of Justice with regard to our request to be put on an equality with the other recognised professions in the matter of evidence before the courts. That Department seemed at first surprised to learn that other kinds of chemists than apothecaries existed, and on the fact being brought to its notice evidently concluded that as analytical chemists were not already on the list of approved professions they must be regarded as in some way inferior and not worthy of inclusion therein! A reason for this apparently lies in the fact that the public so seldom comes into contact with the analyst both because they so seldom require his services and because his numbers are few in consequence. Medical practitioners they must all perforce, with very few fortunate exceptions, come into contact with more or less frequently; many have business with members of the legal profession, with architects, accountants, and engineers of various kinds, of all these callings the public knows something; of the analytical chemist little or nothing. The position, of course, is that the training of the properly qualified analytical chemist is little if any inferior to that of a doctor or lawyer, and though it is admittedly difficult to compare qualifications so dissimilar, it may be maintained that a course of training of university standing is in these days almost essential. This lack of knowledge partly accounts for the poor esteem in which the profession is, in many quarters, held, but there is the further factor that no official cognisance is taken of the qualification of a person desiring to practice as an analyst, and this has undoubtedly led to grave abuses by unqualified, self-styled chemists, which of course tend to bring the profession as a whole into disrepute. All branches of industry are slowly but surely passing under more scientific control, as it becomes more clearly recognised that they cannot continue to operate under the "rule of thumb" methods. In most cases this is the result of stern necessity; those which do not travel with the times must fall out of the race, but it follows that the number of chemists required in the world's industries steadily increases. This of itself should tend to the improvement of status. At first, no doubt, a manufacturer who decides for the first time that he must have a chemist has nebulous ideas on the subject of remuneration, but does not err usually on the side of overpayment. Consequently the first step in this direction has all the chances in its favour of ending in disappointment. But the need still existing, he must infallibly conclude that what he needs is a better chemist, and in the ordinary way would have to pay more. Perhaps, however, because the annual output of chemists has been excessive, though this is an open question, certain it is that in many cases a competent chemist has been secured at a quite inadequate salary, which inevitably reacts on the whole profession. In many cases the value of the chemist has been spontaneously recognised, but on the whole it can scarcely be considered that the status is satisfactory. Another factor which militates against the profession as a whole is the fact that in some industries in which a certain amount of chemical control is essential to the proper conduct of the operations, the particular tests required are of a routine character, just the same day after day, and capable of being taught—rule-of-thumb—to a quite unqualified person who would carry them out, given ordinary intelligence, and so long as no difficulty arises, in a perfectly satisfactory manner. Hence we have, for example, phosphorus boys or even girls in some steel works laboratories. Such a person should no more be considered a chemist, because he happens to be *au fait* with certain manipulations, than a dispenser should be labelled a physician; yet he is generally styled as such, and his limitations react upon fully qualified men. It is this possibility of a very limited part of the whole field covered by the profession being dealt with successfully in a "rule of thumb" manner by untrained men which has caused the works chemist or assayer in many cases to be looked upon and graded as of about the same status as an artisan. This certainly constitutes a difficulty, but I do not think that we agree to or accept the principle that because a man happens to carry out such work he need have no higher capabilities. The mere fact that a chemical process is being used or controlled tells us that something is in use which is capable of improvement and who so able, if qualified, to note present drawbacks and possible improvements as the man who is on the spot making control tests? Such a man might conceivably save his employers large sums in these directions; what a field, for instance, he has in connection with "trade wastes"; and from this point of view it would most certainly be of advantage to employ—even for routine work—a qualified chemist, but this is a point of view which needs pushing. It is with this in view that the Council recommends the admission as associates of practising chemists and assayers who may not as yet have attained to sufficient qualification for full membership; the ultimate raising of the status of all engaged professionally as industrial chemists. This country is not alone in this matter, however; in a recent number of an influential British trade journal, not to chemistry, but to the metal industries, attention is drawn and support given to a movement for the betterment of the remuneration of chemists and metallurgists. Therein it is stated that the profession, though "one of the most important in the country, has been allowed to become little better than a trade." It is further stated most definitely that it is not to the manufacturers' advantage to encourage cutting of prices, and cheap analyses are generally worse than useless. This from a manufacturer's organ comes most opportunely, and I hope is significant of a change of opinion in the matter and greater appreciation of the usefulness and value of chemists and their work. Complaints are often made by chemists of the existing state of affairs, and it is of course one of our objects to attempt to remedy it. Individual action is comparatively useless, and of no use at all in connection with the legal recognition which we hope for. It is only by concerted action that we can make ourselves heard by Government and other public bodies and an improvement in the conditions brought about. But if chemists do not help themselves by joining the Association and enabling us in time to represent all the chemists within the Union, our efforts, directed to the welfare of the whole profession, are necessarily weakened. The plea for not joining so frequently advanced, that "I do not see that it will do me any good," I have no hesitation in characterising as both feeble and selfish. It does good to any man to belong to an Association of this kind for the common good, such being on a small scale merely a reflection of society as a whole. Presumably such an one is willing to share in the fruits—whatever they may be—of the Association's efforts, but is loth to bear any share of the effort! In reading the Presidential address of Professor R. Meldola to the Institute of Chemistry last year, I was much struck by his confession of changed opinion with regard to the utility of the Institute; from having viewed the movement resulting in its formation with disfavour or indifference, holding that there was no scope or justification for the foundation of another body of chemists, he had since been convinced that it had "a public mission to fulfil of precisely the same order of importance as that discharged by any other body of professional men who serve the community in one capacity or another." At the outset we here have met with a full share of the firse mentioned state of opinion, but I am confident that we shall also in due course witness the same change of feeling. While public appreciation may, and doubtless will, come slowly, our status will not be satisfactorily secured without Government recognition as necessary for the public protection as our own, and to this end our energies must be chiefly directed in the near future. Following upon that, professional conduct can be effectively controlled, unqualified practitioners checked, and the status of the profession and of individual members undoubtedly improved. While following certain well-defined rules of professional conduct, the underlying idea of which is the insistence upon the strictest probity and fair dealing not only between member and client, and member and member; but also between member and public so that all care shall be taken to avoid any report misleading the latter; *I* do not think there should be too strict adherence to, shall I say? antiquated professional feeling in the conduct of the business side of our professional work, *e.g.*, we permit a limited and decorus kind of advertisement in the technical press, we do not, as has been suggested, expect a practising member to sit in his office and wait for someone to bring him work, instead of, as need may arise, seeking it; of course in a proper manner—I do not mean barefaced touting. I am afraid that in these days of strenuous professional competition such would not only be too much to expect of human nature, but distinctly unfair. There are, however, ways and ways of doing so, which I need not particularise, and the Council would be perfectly right in using its powers to suppress abuses. To some extent it may be urged that professional practice in this respect is a matter of opinion—at least the Association can guide opinion. Since we insist upon the professional chemist having had a thorough preparatory training, it is only right that we should interest ourselves also in the acquirement of that training. Our population at present is, like our own numbers, comparatively small, but in each of these respects we look for rapid increase, with a consequent growth of industries needing chemists. Some at least of these, and I hope a majority, will be trained in this country, some perhaps wholly in the various colleges, and others in the laboratories of practising members. More particularly in the latter case, some more or less close supervision, and perhaps even provision for examination, may become necessary in time to come, in order to safeguard the proper qualification of members. As distinct from professional, there are technical matters which will engage the attention of the Association as its membership and funds increase, without needing to trench on the province of older societies with wider aims and objects and for which there is certainly a need. For example, some time ago the South African Engineering Standards Committee was constituted, and duly appointed a Chemical Sub-Committee to deal with that section of the work. That sub-committee did some valuable work and issued three reports; meanwhile the chief committee apparently stagnated, and the chemical sub-committee in due course followed suit and has done no work for the last year or more. I would like to take this opportunity of suggesting that our Association carry on the work of this moribund sub committee. Further, all of us in our work use certain methods for certain determinations, or go about certain operations in certain ways, but it is unlikely that we would all use the same method for the same determination. Some of these methods will probably tend to give somewhat different results from others, though possibly possessing compensating advantages such as superior rapidity. This want of uniformity of method leads in many cases to discrepancy in results, and as the differing results cannot all be correct it behoves us to try to discover the causes of error and the best method in each case. Again, new methods and processes of analysis are continually being brought forward, some of us from time to time give them a trial, and occasionally we adopt them, because, presumably, we find they offer certain advantages, and in such cases we should, I think, be unselfish enough to communicate our experience for the benefit of other members. Published methods often look very attractive on paper, but on trial may exhibit grave practical drawbacks. In the same way I suppose we all from time to time evolve—I will not say invent—improvements in practice of greater or less importance which might be of value and would certainly be of interest to others. As with methods of analysis, so with methods of adulteration, and unfortunately there seems to be no limit to the ingenuity displayed in this direction. The skill of the analyst is often severely taxed, and the difficulty of detection continually increases. I look forward, therefore, to the time when we shall hold periodical meetings, at which such points are discussed and issue reports for the benefit of members who cannot attend. Analytical and consulting chemistry, like all other scientific professions, cannot develop and progress entirely independently of others. All are based on the operation of certain fundamental natural laws, and in their development progress in one reacts upon and influences others. I think it will be readily admitted that during the last decade or so, progress and achievement in scientific industry has been more rapid than at any former stage and seems to show no sign of diminution. But chemistry has ever been in the forefront of the race; problems which may well at one time have appeared impossible of solution have one by one been solved. Many more still remain, and in concluding I am sure you will all join with me in the hope and resolve that no effort on our part will be lacking to maintain the dignity and further the progress of our profession of analytical and consulting chemistry.

LAW REPORTS AFFECTING MINING.

Union Government v. Knights Deep—H. G. Flanagan and J. Flanagan v. G. Peel.

SUPREME COURT OF SOUTH AFRICA (TRANSVAAL PROVINCIAL DIVISION).

[BEFORE THE HON. THE JUDGE-PRESIDENT, J. DE VILLIERS, AND MR. JUSTICE CURLEWIS.]

UNION GOVERNMENT vs. KNIGHTS DEEP, LTD.

Special case stated under Rule 46 *re* the amount of profits tax to be paid by the defendants in respect of the Simmer and Jack East, Ltd., on September 26, 1912. The defendants, who were at the time carrying on the business of gold mining on their Knights Deep property, purchased by public auction from the liquidators of the Simmer and Jack East, Ltd., "the property and all other assets" of the company as a going gold mining concern for £250,000, and defendants continued to carry on the gold mining. It was admitted that the defendants were liable to the Court under Section 3 (b) of Act 6, 1910, in the annual tax of 10 per cent. on its profits of mining gold. It was also agreed that of the purchase price of £250,000, the sum of £203.233 related to "amortisable assets," the balance relating to assets which did not rank for amortisation under Section 4 of the Act. In terms of Sections 4 and 5 of the Act, the ascertained capital expenditure which ranked for amortisation made by the Simmer and Jack East, Ltd., prior to the above purchase amounted to £1,352,066, of which amount, prior to purchase, £415,772 had been provided for by way of allowances made for amortisation and capital expenditure, leaving an unamortised balance of £936,294, or, after allowing for interest, of £706,015. The dispute was whether the defendant was entitled to the allowance for the purposes of amortisation on the basis of this amount of £796,015, as contended by the defendants, or on the basis of the £203 233, as contended for by the plaintiffs. The tax in the former case would be £7,524 18s., and in the latter case £10,071 18s.

Mr. Beyers, K.C., Attorney-General (with him Mr. Te Water) appeared for the plaintiffs, and Mr. Stallard, K.C. (with him Mr. Taylor) for the defendants.

The Judge-President, in the course of his judgment, said, after citing the various relevant sections of the statute: No difficulty would have arisen if the Simmer and Jack East, Ltd., had continued to mine for gold; the tax would then only be £7,524 18s. It was, however, argued that the sale of the property to the defendants makes all the difference. It is said that the principle underlying all taxation is that it is a personal tax; that in this case the tax cannot be said to run with the mine, and that the new owner cannot rely upon any capital expenditure of his predecessor in title. I find myself unable to agree with this contention; the wording of the Act is opposed to this construction. Moreover, the sum to be ascertained is a sum which, if paid by way of the life of the mine, would produce at a certain rate of interest a sum equal to the amount of the capital expenditure. The period which is to be covered dates from the commencement of production. It was said that "production" here means when the new owner commences to produce; but there is nothing in the section to support this view. The period of production is used as distinguished from the period of development which preceded it. The Legislature seems to have assumed that, in spite of depreciation, whatever capital has been spent in equipment and developing a mine is so much to the good, and allowance must be made for that for amortisation purposes, regardless of who the owner may be for the time being. From the title and section of the Act the tax would appear to be rather a tax on profits of mining, and not a tax of a personal nature. I am therefore of opinion that the contention of the defendants is the correct one, and that plaintiffs' claim must be dismissed with costs.

Mr. Justice Curlewis read a concurring judgment.

WITWATERSRAND LOCAL DIVISION.

[BEFORE MR. JUSTICE GREGOROWSKI.]

HENRY GEORGE FLANAGAN AND JAMES FLANAGAN *vs.* GEORGE PEEL.

ALLEGED MISREPRESENTATIONS.

In this action plaintiffs, described as farmers, carrying on business in co-partnership in the Komgha District of the Cape Province, were suing defendant, a stockbroker, of 199 New Stock Exchange, for cancellation of an agreement to buy certain 200 shares in the Kromdraai Mines, Ltd., sold by defendant to them for £400 on 24th October last through his agent, one C. J. Coates, and for refund of £100 paid on account, and the return of a promissory note for the balance. They claimed cancellation on the ground that Coates had induced the agreement by certain three representations which plaintiffs alleged were false. These representations were (1) that Coates himself had invested £4,000 in the Kromdraai Mines; (2) that the company had itself spent £50,000 on the development of the property; and (3) that the mine was rich and a good investment. Defendant admitted that Coates was his agent, but for the purposes of sale only, and denied that these misrepresentations were made. Alternatively he pleaded that if made, Coates had no authority to make them, and that in any event the mine was a good investment. It was admitted that Coates had not himself invested £4,000 in the mine, and that the present company had not spent £50,000 on the property, but it was contended that that sum had been spent by Peel's predecessors in title, and that the property was developed to that extent. The mine in question is situate about seven miles north of Krugersdorp, and its history goes back to many years before the war. It was then the property of the North Rand Company, which was floated with a capital of £150,000. During the war the whole of the plant was destroyed, and except for a little work since by the Kromdraai Mines, Ltd., a company with a capital of £12,000, and some individual efforts, the property had not been worked until Mr. Peel took it in hand. Further plant and further capital being necessary, Mr. Coates went down to the Cape Province to endeavour to raise a sum of £6,000 to get the mine going once more; and it was in the course of this trip that he succeeded in getting a number of the Komgha farmers, including the plaintiffs, to take shares. In consequence of "rumours," plaintiffs now sought to repudiate their contract.

Dr. Manfred Nathan (instructed by Messrs. Gedye & Peacocke) appeared for the plaintiffs, and Mr. Stratford, K.C., with him Mr. G. Hartog (instructed by Messrs. Davis & Allingham) appeared for defendant.

The witness box was occupied for the best part of a day by the Flanagan Brothers. The rumours that prompted them to repudiate, they said, were to the effect that the mine was worked out. The elder Flanagan said that his only knowledge of mining were some experiments with a divining rod following reefs in Rhodesia.

His Lordship: You might have used a divining rod at the Kromdraai Mines. (Laughter.)

When they asked Coates why he came down there to raise money if the mine was so rich, he replied there was no money in Johannesburg.

His Lordship (to Dr Nathan): You don't rely upon that as a misrepresentation, do you? (Laughter.)

They added that Coates went on to say that the men he wanted were men of substance, not speculators, but men who would hold their shares.

The case was adjourned.

THE STANDARDISATION OF MINING ACCOUNTS.

[By Charles Hewitt, A.S.A.A.]*

In an article in the last issue of this journal (*S.A. Accountant and Auditor*) I touched shortly on the question of standardisation of mine accounts, and in doing so I made some reference to the efforts which the Institution of Mining and Metallurgy had made in the matter. Since the article appeared I have seen the report of the Mine Accounts and Cost Sheets Committee of the Institution. The report will doubtless prove of great interest even to many who may differ from some of the conclusions arrived at. A summarised statement of the recommendations is first given, which is amplified in a longer memorandum explaining the grounds on which the conclusions are based. One fact that strikes the local reader very forcibly is the extent to which the report in its broader outlines has been influenced by Witwatersrand practice. This is evident in many parts, but in particular in the proposed classification of expenditure, both capital and working. For example, a suggested classification is given of expenditure charged to capital account in the case of companies which have not yet reached the producing stage. This is identical with the classification usually adopted on these fields, not only as to the heads of accounts, but also as to the order in which they are marshalled for inclusion in the balance sheet.

REALISATION CHARGES.

The same applies, though possibly in a less striking degree, to the recommendations as regards the headings which the Committee think ought to be adopted for the working and profit and loss accounts. There are, of course, exceptions, as, for example, the suggestion that realisation charges should be a working account, and the gross value of the mineral taken to revenue. Admittedly some groups on the Witwatersrand adopt this practice, but I think a large majority take the net value disclosed in the account sales to revenue. As regards gold, and under our Witwatersrand conditions, it would be absurd to say that either system is wrong. In favour of taking net values to revenue it is urged that the realisation charges bear an almost constant relation to the value of the precious metal realised, and therefore to the tons milled. For this reason their inclusion on the debit side of the account serves no useful purpose and involves a few additional book-keeping entries monthly. One can only deplore the fact that on so simple a matter there is a diversity of practice. Of course, in discussing the report it is necessary to keep before us the fact that it is intended to indicate the practice which should be adopted in the accounts of all kinds of mining concerns, including base metals, the realisation charges of which would be a large and fluctuating quantity. Another matter to bear in mind is that the report is written by gentlemen skilled in the technical rather than the financial control of mining industry, though doubtless they were assisted by accountants, and the points of view of the accountant and the engineer do not necessarily synchronise. This must not be construed as a suggestion that accountants should resent their preserves being trespassed on by engineers. Some resentment might be justified were it not for the fact that those concerned with the financial side of mining have neglected their plain duty in the matter. For this reason the efforts of the Institution of Mining and Metallurgy in endeavouring to repair the effects of this neglect is in the highest degree commendable.

EXPEDIENCY versus THEORY.

Not only is there at times a variation between the points of view of those controlling the industry from a technical standpoint and the financial department, but also practices to which in theory the accountant can take no possible objection are sometimes vetoed on the ground of expediency. Many examples where such considerations might arise occur in the report. The following quotation supplies one: "Such items of capital expenditure should bear their proportion of general charges." This refers, of course, to the period after the producing stage is reached. This dictum is irreproachable in theory, but in practice the accountant will, I think, be inclined to prefer the method generally adopted in these fields of only allowing capital expenditure to be loaded to the extent to which general charges have been increased by the fact that capital expenditure is in progress. Take the case of a mine carrying on an extensive construction and advance development programme. The expenditure on capital account might often exceed the working costs in which case more than half the general charges would go to capital. The suggested items of general charges given on another page of the report, to which, with the exception of one or two, no exception can be taken, include several that would not be in the least influenced by a large scale of construction operations. It seems to me that under such circumstances it would be inadvisable to charge to capital any costs which are not directly occasional by the scale of construction and development. Apart from any other consideration there would be a severe disillusionment awaiting the manager on the completion of his construction programme.

DEVELOPMENT.

An objection which can be fairly urged against several parts of the report is its want of definiteness. The object—and a highly commendable one it must be admitted—is to secure uniformity on matters on which at the present time, diversity of practice exists, yet on some of the most controversial points in mine accounts the Committee merely indicate the different existing systems without expressing any preference or making any recommendations. An example of this is found in the very thorny question of development. "All expenses of development," we are told "should be charged (a) direct to the working costs or (b) to the development redemption account." The report goes on to describe the ordinary method of safeguarding the development redemption account in the event of the latter system being adopted. When the question of standardisation of mine accounts comes to be discussed, one of the first points which has to be tackled is the correct manner of dealing with development, and for this reason it is a great pity that the Committee did not express an opinion. Certainly, at a later stage in the report a courageous attempt is made to enumerate the constituents which should go to make up the development account, but here the Committee are in conflict with approved practice. In the matter of development more than in any other, theory has had to give way to expediency. "Development," we are told, "should be charged its proper proportion of surveying, sampling and assaying costs, pumping and hoisting costs, and be credited with the ore won in development at the average stoping cost, the amount being charged to mining." There are many obstacles in the way of the adoption of the principle enunciated above. In the first place, the pumping costs cannot be very greatly influenced by the amount of development, and in any case it is quite impossible to say how much should go to development and how much to mining. Then as regards the proposal to credit development and debit mining with the gold won, who is to say the amount of gold won from development rock? A good deal of the country rock comes away with the ore for which reason the assay value of the face is no indication of the value of the rock which goes to the mill. Further, the rock is often broken so fine as to be incapable of being sorted. Actually it may not be worth sending to the mill at all, and managers have often told me when discussing this subject that if their mining costs were debited in the manner suggested they would store the rock from the development faces underground. It seems to me that the simplest and most effective course is to charge development with the cost of breaking the rock, and to charge the other items to working, unless they are seriously influenced—which, as a rule, they are not—by the scale of development operations. At the same time, it is only fair to say that in the theory there is little fault to be found with the system recommended.

ALLOCATIONS AND DISTRIBUTIONS.

On the question of "Administration and General Charges," the Committee lays down as a guiding principle "That all possible expenditure at the mine be allocated to the different departments concerned." Then follows a list of items which are given as cases in point. Many of these items could pass without comment, and if the statement quoted stood alone perhaps criticism could be dispensed with. But the report contains so many evidences of a desire for "allocations," some of which I have already referred to, that a word or two on the subject and on the considerations which have led many of the groups on these fields to abandon the system of straining after "allocation" may not be out of place. When an item which is clear, definite and "understandable" is split up into two or more parts either by rule-of-thumb or on a prearranged (though problematical) basis, the effect is that an item which can be understood and controlled is abandoned in favour of two or more items, all of which are probably incorrect. One frequently comes across mines which have reduced their system of allocation and distribution to a fine art, with the result that the figures ultimately arrived at, though they may reflect with an approximate degree of accuracy the costs of the various processes and departments, are frequently useless for the purpose of scrutiny. I will give an example of this. If the manager finds that variations in the cost of breaking rock in the stopes call for his attention, he may find that they are due to an increase in the proportion of the rock drill running account which goes to stoping. He analyses the latter account, and discovers that the increase is owing to the heavy proportion of air power. Air power account is next scrutinised, and the scrutiny indicates that the trouble will be traced if compressor running is examined. The manager may think that at last he has reached the root of the trouble and may, of course, find that the fluctuations are due to the smaller use of air in other departments, air winches or ventilating. On the other hand, it may be owing to an increase in the boiler account, due perhaps to the installation of a new set of tubes. This is an example, and not an exaggerated one, of the difficulties created by intensive distribution. It is, of course, admitted that a certain amount of distribution is unavoidable. My point is, however, that far from encouraging the system, as it would seem to be the desire of the gentlemen who wrote the report, it should be reduced to a minimum. It may be possible, especially on mines where there is little or no capital expenditure and where the amount of development follows roughly the milling requirements, to do away with the rule-of-thumb allocations entirely.

DEPRECIATION.

A considerable section of the report deals with the highly important subject of depreciation. The subject is a big one and justice cannot be done to it within the limits of this article. Here, again, one complains of indefiniteness, in that, although many systems are described, little or no indication is given of the particular one preferred by the Committee. There is a significant passage at the conclusion of the section dealing with depreciation, which may arise between the engineer's and accountant's points of view. It is stated "That these recommendations should be carried out as soon as there is an available balance to the credit of Profit and Loss." It is hardly necessary in an Accountant's Journal to comment on the proposition that, if depreciation is necessary at all, it need only be provided for during the "fat" years. Although certain sections have been singled out and criticised, it must be admitted that there is a great deal that is of considerable value in the report, in spite of the obtrusion of the engineers' point of view. Anyhow, it is a valuable contribution, to a subject, the importance of which will one day be more fully recognised.

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*From the *S.A. Accountant and Auditor*.

Rhodesian Section.

LATEST MINING NEWS.

Railway Rates on Asbestos—Globe and Phoenix Company's Output—A New Company —Shamva Mines—The Falcon—The Kambanje Mine—Eldorado-Kafue Railway.

In the Legislative Council the other day Mr. Begbie moved that the Government be requested to make the necessary representations to the Railway to adjust railway rates on asbestos, with the view of ensuring the industry being placed on a payable basis. In reply the Secretary for Mines said he was sure that the Government equally with the hon. member for Victoria were glad concerning the new discovery of asbestos in the Victoria district, where they all looked forward to its being a great success. In regard to that matter he might say that he had had correspondence and also conversations with the General Manager of Railways and with the Commercial Representative as late as May of the present year. When the General Manager had visited Victoria it was the chief point brought forward by the workers of fourth grade asbestos; they wanted a particular reduction. In regard to the higher grades of asbestos, he did not see any particular complaint. What was pressing hardly was the rate on the fourth grade asbestos, which was not so valuable as the better classes of asbestos, a great deal of which he thought was not being produced by Mr. Frankis. The General Manager he knew was enquiring into the matter, and so was the Commercial Representative, and he was sure that the Government would have much pleasure in making representations to the General Manager of Railways with the hope that those representations would induce the General Manager to give the whole industry further help in the matter of railway rates. The motion was agreed to.

* * * *

The May output of the Globe and Phoenix was:—Mill, crushed 6,546 tons; yielding 5,388·20 ozs. fine gold. Concentrates (tons treated) 265 tons; yielding 477·62 ozs. fine gold. Sands treated, 4,425 tons; yielding 1,096·06 ozs. fine gold. Slimes treated, 2,277 tons; yielding 497·40 ozs. fine gold. Total value, £31,342 15s.

* * * *

The Glen May (Rhodesia) Mines, Ltd., was registered on May 14 by Lawrence, Jones & Co., 4, St. Mary Axe, E.C. Capital, £120,000 in 5s. shares. Objects: To acquire any concessions, grants, decrees, options, licences, leases, rights, powers, and privileges, and mines, metalliferous and petroliferous lands containing or supposed to contain coal, anthracite, bitumen, oil, clay, iron, copper, lead, tin, silver, gold, asbestos, sulphur, precious stones, or other minerals or substances in any part of the world, and to adopt an agreement with the liquidator of Soowin Concessions, Ltd. Minimum cash subscription, ten shares. The first directors (to number not less than three nor more than seven) are Bento y Vieira, 8, Old Jewry, E.C.; M. Thalmassinger, 20, Copthall Avenue, E.C.; A. W. Cohen, 11, Queen Victoria Street, E.C.; and L. Hill, 50, Barons Court Road, W. Qualification, 100 shares. Remuneration (except managing director), £100 each per annum (chairman, £150), and 10 per cent. of the net profits. Registered office: 11, Queen Victoria Street, E.C.

* * * *

The following is a text of a cable recently despatched from the local to the London office of the Falcon Mines, Ltd.: Ltd.:—" No. 4 level, No. 6 crosscut south from west drive width of reef so far exposed 20 ft., average assay value 4·4 dwts. reef continuing in face."

* * * *

The following is the text of a cable recently despatched from the local to the London office of the Falcon Mine, Ltd.: " No. 7 level at 40 feet west from vertical shaft crosscut reef averages 62s. over a width of 10 feet—stop—Width not yet fully exposed."

A progress report on operations on the Lomah (Rhodesia) Company, dated May 16, says:—Kambanje Mine: New main shaft, 235 ft. deep. West (D) shaft 145 ft. level. East drive, 29 ft. from shaft, face is showing good (gold) values. Official note.—The east drive (D) shaft is now opening up another pay shoot about 700 ft. to the west of main shaft.

* * * *

Messrs. Pauling & Co.'s surveying party, headed by Mr. Buncombe, arrived at Kafue on the 2nd inst., having traversed the route of the proposed new railway, Eldorado to Kafue, and from reports it now appears certain that the junction on that side will be somewhere about half-way between the bridge and Nega-Nega siding.

* * * *

The report of the Cam and Motor for May states:—Six ball mills ran 547 hours, and six roasting furnaces 653 hours, treating 11,120 tons raw ore; gold recovered, 3,292 ozs.; estimated value, £13,958; actual evtraction, 57·8 per cent.

* * * *

We take the following from the development statement of the Planet-Arcturus Co. for the quarter ended March 31: Ore reserves—Areturus Mine: Developed during quarter, 5,120 tons; value, 10·1 dwts. Planet Mine: Developed during quarter, 973 tons; value, 10·1 dwts. Slate Mine: Developed during quarter, 4,905 tons; value, 7·4 dwts. Summary: Arcturus Mine, 187,944 tons; value, 11·1 dwts. Planet Mine, 26,268 tons; value, 14·5 dwts. Slate Mine, 119,473 tons; value, 13·9 dwts. Total ore reserves, 333,685 tons; value, 12·37 dwts. Arcturus Mine: Work was resumed in February—opening up the 5th level—with good results, some high values being met with in the west drive. Planet Mine: This mine has been shut down since January 31, and so the work done in that month has only made a slight addition to the ore reserves for the quarter. Slate Mine: Work during the quarter was confined to opening up the 5th level.

King Asbestos (Rhodesia), Ltd.

The secretaries report as follows:—Mr. Colin Campbell has recently returned from a visit to the property and reports as follows:—The long cutting connecting the deep quarry and open cut crosses diagonally the strike of the deposit and shows fibre of average percentage throughout. The cutting is about 9 ft. average depth. The large quarry is now somewhat over 42 ft. in its deepest section. Here the fibre is of excellent quality and averages 8 to 10 per cent. During the month 65 tons of asbestos have been shipped and 30 tons accumulated in the sheds. The recovery for the month is therefore 95 tons. Native labour is plentiful and boys are being daily turned away.

Rezende Mines.

The results for the month of May, 1914, are as follows: Estimated profit: Central Section, £1,832; Old West Workings and Penhalonga Sections, £1,244; total £3,076. Note: The board of directors in London have declared a final dividend of 7½ per cent. for 1913, making 15 per cent. for the year. Warrants were posted to shareholders on May 29th last.

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Engineering Notes and News.

S.A. Institution of Engineers.

The Council of the South African Institution of Engineers has decided, in order to make the institution more businesslike, to dispense with the several committees which it constituted in the past and to appoint two in their place—the General Purposes Committee and the Finance and Editorial Committee. The Council, which, as was pointed out earlier in the week, is exceptionally strong and representative, thinks that in this way the work of the institution will be more thoroughly dealt with and its prestige more likely to be maintained and increased. The following gentlemen have been nominated to the two committees:—General Purposes Committee: Messrs. W. Ingham, W. Calder, D. Cullen, C. D. Leslie, S. McChesney, E. M. Smyth, A. Wallace, and R. C. Warriner. Finance and Editorial: Messrs. B. Price, E. Goffe, R. C. Atkinson, Kenneth Austin, E. G. Izod, R. N. Kotze (Government Mining Engineer), J. G. Lawn, and H. Stuart Martin. Mr. E. J. Way, the President of the Institution, is an *ex-officio* member of both committees, as is Mr. Alpheus F. Williams, of the Kimberley branch.

A demonstration was recently given by the Oil and Carbon Products, Ltd., of the new plant which has been erected at the Thorneycroft Works, Chiswick, for the distillation of motor spirit from cannel coal, shale, etc., by the Del Monte process. The results of the tests show that there would be obtained per ton of cannel about 17·4 gallons of refined motor spirit, 17·6 gallons of fuel oil, 37·5 lbs. of paraffin wax, and 51 lbs. of pitch. In addition, about 54½ lbs. of sulphate of ammonia is obtained. From the fuel oil, by a process of "cracking," a further quantity of spirit suitable for petrol engines may be obtained.

The spirit is described as colourless and of aromatic odour, and a trial of it in comparison with Shell No. 1 petrol showed that it was quite equal to that spirit as regards mileage per gallon, while it was rather easier in starting and gave more power on hills. No alteration in the carburettor was necessary. The Del Monte process is described as simple in operation, and is of the greatest interest to every British motorist, providing, as it does, a home-produced fuel. Mr. W. J. Atkinson Butterfield, under whose observation the tests were carried out, states that "if the motor spirit were regarded as a by-product of the process, and the other products were sold at current market values, the cost of production of motor spirit would be less than 1½d. per gallon."

The demand for motor spirit is increasing at an amazing rate. During the current year, from such figures as are available, it is calculated that the increased consumption will amount to 150 millions of gallons. This, over and above what was already being used. The vast oilfields of Pennsylvania are gradually becoming exhausted, but others in various quarters of the globe have been discovered, and there are doubtless many more yet awaiting discovery. But the supply. nevertheless, only barely keeps pace with the ever-increasing demand, and every new source of supply is of the greatest importance to automobilists. It may be confidently asserted that but for the alternative fuel supplied by the greatly-increased output of benzole, the price of motor spirit would to-day be 2s. 6d. per gallon in England.

The lines along which research is proceeding in order to meet these growing needs is to produce, not substitutes for petrol, but additional fuels suitable for use in the petrol engine without the necessity of change in the carburettor. Benzole fulfils this condition admirably, and great expectations are entertained in regard to alcohol. The difficulties in the way of the production of the latter spirit are, of course, the excise restrictions. There appears to be no doubt that large quantities can be produced on a commercial basis, but in order to be exempt from excise duties the spirit must be denatured. Recent experiments have shown that benzole and alcohol in equal quantities form an excellent fuel for petrol engines without any alteration to the carburettor, and as benzole is an adequate denaturant, it is hoped that all excise requirements may be met in this way.

New Patents.

213. Frederick Albert Wieland.—Self-propelled vehicles.
214. Henry Thomas Durant.—Improvements in or relating to the extraction of zinc from its ores or products.
215. Lewis Condict Bayles.—Improvements in fluid operated percussive tools.
216. Friedrich Hausser.—Process for the absorption of dilute nitrogenous gases by water.
217. Henry Candy and William Young.—Improvements relating to the construction and arrangement of guides for stems used in milling batteries.
218. Donald Donald.—Improvements in wire strainers.
219. Robert Farmer.—Improvements in controlling means for winding, hoisting, hauling and similar engines, electric hoists or the like.
220. Henry Samuel Potter.—Improvements in devices for supplying fluid to rock drilling tools.
221. William Henry Gordon.—Improvements relating to stamp heads for stamper bars.
222. Lancelot Ussher and Armour Hall.—Improvements in compressing air.
223. Horatio Dunn.—Improvements in the method of igniting safety fuses as used in mines, quarries and the like.
224. Paul Hebert.—Improvements in securing rails to the sleepers.
225. James Wilshir and Wm. Martin.—Connectors.
226. Cecil Stuart Cannon.—A new or improved device for measuring and indicating and/or recording the magnitude of the pull or force exerted on the reins by a horseman.
227. James McIndoe.—A rapid calculator.
228. Alb. Nurnberg.—A Harz rock drill.
229. Seguin Fisher.—Improvements in water connections for hollow rock drills.
230. James McKanzie Martyn and William George Holford.—Improvements relating to bailing tanks.
231. Raleigh Adelbert Black.—An improved self-cleansing drinking trough for horses and other stock.
232. Thomas Dawson.—An improved ox yoke in combination.
233. Armand Judlin.—An improvement in advertising.
234. Daniel Shaw Waugh.—Improvements in drilling machines.
235. R. van Powys.—Improved chain drive for mechanical haulages, etc.
236. Daniel Corlett.—A new type of rope grip.
237. Guglielmo Marconi, William Snowley Entwishle, Marconi's Wireless Telegraph Company, Ltd.—Improvements in transformers for high frequency currents.

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COAL MINES RESCUE STATIONS.

Report of the Union Government Committee of Enquiry.

THE Report of the Committee of Enquiry into the Natal Coal Mines Rescue Stations is as follows:—

1. The Terms of Reference to your Committee were: (a) The establishment and equipment of rescue stations for the Natal Collieries; (b) the staff to be provided; (c) the training of men on the mines for rescue work; (d) the method of defraying the expenditure to be incurred; (e) any other matter pertinent to the enquiry. 2. The witnesses, of whom a list is given in the attached Appendix B, were either invited to give evidence, or in response to advertisement, proffered their evidence. As showing how little rescue work is understood in South Africa, only one witness volunteered to give evidence, although advertisements were freely inserted in the newspapers. 3. At the start of their enquiry, your Commissioners found that very few persons in South Africa had any practical knowledge of rescue work or rescue stations, and it was found necessary to obtain information from the Home Office, and from colliery managers and others in Great Britain. 4. Your Committee has been delayed in the issuing of this report for the following reasons: (1) Illness of members of the Committee. Mr. John Livingstone resigned from the Committee owing to ill-health, and his place was filled by Mr. Owen Walters; (2) the delay caused by the necessity for obtaining much information from Great Britain; (3) the difficulty of arranging meetings except at long intervals, the members of your Committee being fully occupied with their professional and official duties.

HISTORICAL.

5. Although rescue work in mines by the aid of rescue apparatus has received considerable attention of recent years, it is only within the last five years that rescue stations have become common in Great Britain, and that legislation dealing with rescue work has been introduced. In Natal little has been done in the matter, the mining regulations insisted that rescue apparatus should be provided, and this was done, but at none of the collieries were the men trained in the use of the rescue apparatus. 6. The disasters at the Glencoe and Cambrian Collieries, and the fire at the Natal Navigation Colliery in March, 1912, have made it incumbent that rescue corps should be established and properly trained in the use of rescue apparatus. 7. With the recurring gob-fires in the Natal Collieries, another danger has been introduced, and the use of rescue apparatus will be most helpful in dealing with such outbreaks in the future. 8. In Appendix A, a list of the Natal collieries is given, showing the number of persons employed, whether the colliery is fiery or not, and whether the coal is brought to the surface by shaft or adit, also the distance of each colliery from Hatting Spruit.

TERMS OF REFERENCE.

9. Your Committee considers that a central rescue station should be established and equipped. We are of the opinion that the best site for this station would be Hatting Spruit, as that is practically the centre of the Natal coalfields, and the more fiery collieries are situated within a radius of nine miles. 10. One point upon which all the witnesses were emphatic, was the necessity for training men under conditions similar to those which they would meet with in actual rescue work. We consider it essential that a proper training gallery should be erected in which underground conditions are copied, and that the men should be trained in the gallery in an irrespirable atmosphere. 11. Your Committee does not consider that it should lay down exactly what the rescue stations should consist of, but in their opinion a station somewhat similar to that in use at Aberaman, South Wales, would be found quite suitable for Natal. Plans of this station are in the possession of the Department of Mines and Industries, and your Committee estimate that the building of such a station would cost approximately £2,000. 12. The question as to whether a railway coach or motor car should be provided, was fully gone into. It is true that most of the collieries are connected up to the railway with sidings; but it is possible that should the coach be urgently required at a colliery, the main line might be blocked, or an engine might not be forthcoming at once, and so delay would be caused. Your Committee feels that in rescue work, saving of time is of the utmost importance, and that nothing should be allowed to hinder the despatch of the rescue brigade. The roads around the collieries have much improved of late, and there is little risk of a first-class car breaking down. We therefore recommend that a motor car be provided and kept at the station; a suitable car designed for rescue work could be obtained at a cost of £750. 13. The station should be connected up to the main telephone system, and some arrangement be come to with the Postal and Railway Departments, whereby telephonic communication at night could be assured. 14. We recommend that six complete sets of rescue apparatus should be kept at the central rescue station. In addition the following should be kept: 20 electric hand lamps, 2 oxygen reviving apparatus; an ambulance box provided by the St John Ambulance Association, together with antiseptic solution; cages of birds and mice. The central station should also be equipped with one liquid air plant capable of producing 20 lbs of liquid air per hour; 4 cylinders for storing liquid air; 1 motor car. We think that other details of equipment should be left to the Committee of Management, who would have the benefit of the advice of the instructor. Electric power for the machinery at the central station could no doubt be obtained by arrangement with one of the neighbouring mines, and it is on this assumption that our estimate has been based. 15. We recommend that the rescue station should be controlled by a Committee of Management consisting of the permanent instructor and representatives of the collieries of whom one or more shall be mine managers appointed by the mine managers generally, and one or more shall be directors of the collieries appointed by the boards of the colliery companies in such manner as they may mutually agree. The Committee of Management would of course have to work in conformity with the mining regulations. 16. We think the rules to be observed at the station should be left to the Committee of Management; we attach, Appendix D, copies of rules in force at two rescue stations in Great Britain, and we consider that these, with slight modifications, would be suitable to Natal, as a working basis.

THE STAFF TO BE PROVIDED.

17. As so few persons in South Africa have any knowledge of rescue work, it is essential that the instructor should have been in charge of, or at least had experience at, one of the rescue stations in Great Britain. The success or otherwise of the Natal rescue stations would largely depend on the instructor, and we therefore consider that no pains or expense should be spared to secure a thoroughly competent and reliable man. It is desirable that the instructor should be a disciplinarian, and we therefore consider that an ex-Army man should, if possible, be secured. The ideal instructor would be a man who had had colliery experience in his youth, then military training, finally charge of a rescue station, he should, if possible, have sufficient mechanical knowledge to enable him to run the liquid air producing plant, and to effect repairs to the apparatus. There should be no difficulty in obtaining a suitable man from the makers of the type of apparatus installed, and who would have a thorough knowledge of the subject. Your Committee thinks that one instructor would be sufficient to begin with and that in case of sickness, holidays, etc., he might be replaced by his most promising pupil. The evidence as to the salary paid to the instructor in Great Britain varied very much, ranging from £500 per annum and house to £125 per annum and house. The actual salaries paid at two rescue stations in England were £143 and £125, with house, coal and light. Your Committee thinks that while the question of salary should not be considered too closely, as a good man is essential, a suitable man could be procured for £400 per annum, with house and coal. We think that, if possible, a married man should be secured, and that a house should be built for him at the rescue station; we estimate that a suitable house could be erected at a cost of £500. 18. We recommend that the instructor should have entire charge of the rescue station, and all the apparatus therein, and should be responsible for keeping it ready and fit for immediate use. It should be his duty to see that an adequate supply of all requisites is kept at the station. The instructor should also be responsible for the training of the men, and should visit the mines from time to time and see that the apparatus on the mines is in good order and kept ready for immediate use. As the station gets into working order, no doubt other duties for the instructor would suggest themselves; these we think could quite well be left to the Committee of Management to decide. It is possible that it may be necessary to appoint an assistant to the instructor; if this should be so, such appointment could be made from the men who have been trained by the instructor in rescue work. 19. An assistant to run the liquid air plant would be required, but such a man could be obtained locally at a salary of £15 per mensem. Two or three natives would also be required.

THE TRAINING OF MEN ON THE MINES FOR RESCUE WORK.

20. We consider it necessary that each mine should have its own rescue corps, as promptitude in rescue work is obviously of the first importance. We therefore consider it necessary that a brigade of five men should be formed on each mine. Exemption might be granted by the Inspector of Mines to small collieries, situated close together to combine to form one team. 21. It is essential that men should be thoroughly trained in the use of rescue apparatus in an irrespirable atmosphere. A rescue apparatus on an untrained man is a source of danger, but when a man has had a proper training, and has full confidence in his apparatus, he can perform arduous work in a poisonous atmosphere with comparative safety. We consider that, provided their physical and mental condition are equal to it, it should be made compulsory by law for every white miner in Natal to be made liable to undergo training in rescue work. The white miners in Natal are so few as compared with the coloured that, unless training is made compulsory by law, it may be difficult for managers to comply with regulation 277 of the Mines and Works Regulations, 1911, in so far as training one person for every hundred employed underground is concerned. No law can compel a person to risk his life in rescue work, but he undergoes no risk while training. Your Committee is confident that, should a disaster occur, there would be no lack of trained volunteers ready to risk their lives to assist persons in need of aid underground. 22. Your Committee considers it preferable that white persons only should be trained in rescue work; at the same time there are some coloured persons on the mines who would make efficient and useful members of a rescue corps, if they were to receive training. Again, at small mines it may not be found possible to organise a corps of five trained white men, and we think in such a case as this, the manager should be allowed to have coloured persons trained in rescue work. Your Committee therefore recommends that as a rule white persons only should be trained, but are of opinion that there will be nothing to debar suitable coloured persons from receiving training.

(*To be continued.*)

Finance, Commerce, and Industries.

Building Activity. Eight Municipalities in the Transvaal Province during the month of May approved of plans having an estimated value of £81,217, as against £64,677 for the month of April. Two municipalities in the Cape Province approved plans having an estimated value of £15,145 (all the returns are not yet in). Durban Municipality passed plans having an estimated value of £11,363. Bloemfontein Municipality passed plans having an estimated value of £5,540. The following is the estimated value of buildings the plans of which have been approved by the undermentioned Municipal Councils for the month of May, 1914:—Johannesburg, £56,369; Benoni, £4,740; Boksburg, £506; Germiston, £4,870; Krugersdorp, £3,675; Potchefstroom, £3,252; Pretoria, £6,745; Roodepoort, £1,060; Queenstown, £9,500; East London, £5,645; East London (March and April), £2,800; Capetown (March and April), £9,630; Woodstock (March and April), £10,160; Mowbray (March and April), £1,325; Kalk Bay (March and April), £14,240; Claremont (March), £150; Rondebosch (April), £1,250; Wynberg (April), £1,550; Kimberley (April), £4,578; Durban, £11,363; Bloemfontein, £5,540; total, £158,948. Tenders accepted by the Government for public buildings during the month, and not included in the above amount, £161,396 14s. 4d.

* * * *

World's Fair on the Rand. At a meeting of the Committee of the Inter-Colonial Exposition held last week, Mr. I. W. Schlesinger put forward a number of interesting suggestions for the World's Fair which it is proposed to be held in Johannesburg. After dealing with the question of advertising in the right and least expensive way, Mr. Schlesinger said:—To make the proposed Golden City Exposition a financial success I would say that it would be necessary to organise it for single and specific purposes, and not upon a large and general scale. My idea would not be to make the proposed Exposition so vast, but rather follow on the lines of the White City at Shepherd's Bush. I can only attempt in a feeble way to classify some of my own thoughts on the subject of buildings. First of all the Union Government might be induced to erect one, and similarly each and every Province, including Rhodesia, thus forming a colonnade of South African Provinces. The British Government and all British Colonies, including Egypt, would no doubt participate. Our neighbours, the Portuguese, Belgian and German Governments might be approached, and I have no doubt that there, too, we would meet with success. Aside from the two or three buildings that the Exposition Company would erect, all foreign countries might be approached to participate. In any case I feel that a vigorous canvass would bring exhibitors from the remotest parts to the Golden City Exposition. Dealing with the exhibits these could be grouped as follows:—(1) An agricultural building to house agriculture, horticulture, forestry, and game. (2) A machinery building could include an electrical and transportation section. (3) A manufacturers' building could include varied industries sections. (4) An educational building to house liberal and fine arts, including sculptural sections, and lastly, but not least (5) a mines and metallurgical building. I have not overlooked the importance of an amusement section, the concessions of which are important assets to every exhibition.

Mr. Schlesinger was heartily thanked for his suggestions, and a committee of ten of the Civic Association was appointed to go into the matter and draft a report.

* * * *

Auckland Park Real Estate. The report of the Auckland Park Real Estate, Ltd., for 1913, submitted to the meeting on the 11th instant, states that the accounts show a profit of £4,396, which with the amount brought forward, £1,434, makes £5,830. The directors recommend a dividend of 9d. per share, less income tax, leaving a balance to be carried forward of £280. The 68 stands disposed of during the year on Auckland Park and Brixton represent a total of 14·83 acres, the total sale price being £6,317, payable by instalments. The sum of £100 per acre has been allocated to capital account in respect of this area. The balance received during the year has been taken into revenue account. The amounts outstanding will be brought into revenue account as and when received. During the year a further distribution of 40 per cent. was received in respect of the company's holding in Niagara, Ltd. (in liquidation), leaving a balance of 10 per cent., or £1,910, outstanding. Since the date of the accounts, the liquidation has been closed and a final distribution of 5 per cent. received, making a total of 95 per cent. The loss of 5 per cent. has been deducted from the amount held in suspense. Since the date of the accounts £1,000 has been repaid on the Unionist Party Club First Mortgage Bond. Since the close of the financial year a mortgagee, from whom there is a balance outstanding of £4,537 in respect of advances on building loans, has defaulted. The company has foreclosed and taken possession of the properties mortgaged, comprising eight houses in all, three of which are completed and let to tenants, and five are incomplete. The Johannesburg agent advises that it will cost about £3,552 to complete the five unfinished houses, and it is estimated that the eight houses will, when completed, have a value of about £11,000, against a book cost of about £8,000.

* * * *

Purchases by Public Bodies. In the course of the annual report of the South African National Union, it is stated:—" We have endeavoured at various times to emphasise the responsibility resting upon public bodies of this country in regard to the encouragement of local industry. It is evident that they could, if they would, do much to promote that feeling of patriotism which all admit is necessary to national progress. It is also obvious that a judicious encouragement of local enterprise would assist the circulation of money in South Africa itself, a process from which every person in some degree benefits. Public bodies in spending public funds should, of course, exercise the same care as is exercised by an individual in spending his own money. But they should not be limited by the same objects. They must not be guided solely by the immediate cost of the purchase to their treasury, but by its ultimate cost to the community which they represent. And a Municipality in deliberating on the merits of different purchases must consider also that the prosperity of the town cannot stand alone. The prosperity of each citizen, the rateable value of its property, are affected by the welfare of the whole country. But the most farsighted view is that which should be taken by a Government. Unfortunately in South Africa the Executive is divided into Departments so nearly independent of each other that they can scarcely be said in their Departmental work to be actuated by any common aim. The object of each Department under such circumstances must be, and actually tends to be, to consider in making a purchase only the actual amount of money which is immediately involved, and to disregard the more remote consequence of the transaction. Under our present system even a Cabinet Minister can scarcely exercise discretion in favour of giving employment to the citizens of the State rather than to those of

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other countries. How much less, then, can a departmental officer, or such a body as the Tender Board, be guided by any patriotic or national reasons? The question which ought to determine the placing of a Government or Municipal order is not how much must be paid out of the funds voted, but how much will the transaction cost South Africa! Let us take the case of the purchase of a tanned hide for harness making, by the Public Works Department, or for boot making by the Prisons Department. An imported hide will cost the money paid for it at the port, plus the actual cost of carrying it from the coast. The other items of its price will go to support the inhabitants and institutions of the country, the forwarding agent, the railways, the importing merchant. If a South African hide is bought it will have been exported originally from a South African farm. In its passage from the farm to the consumer it will have been a subject of profitable exchange to the cattle dealer, the railways, the auctioneer, the butcher, the fellmonger, and the tanner. What has it actually cost South Africa to produce that hide on the farm? It is to be measured by the actual cost to South Africa of the food which has been consumed, the clothes worn out, and the use of the land by the farmer and his hands while they were engaged on its production. And similarily with the middlemen, the surplus profit they make carries no benefit or loss. It merely passes from hand to hand. The cost to the country is only the net cost of the things these people consume in the course of this transaction. It is infinitesimal compared with the value paid away to other lands for imported hides. And even then, slight as it is, it has gone towards supporting inhabitants of the State who are at all times exerting the various energies of citizens, who are the most valuable of all State assets, and who in the last sense constitute the State itself. The country generally, for all are more or less affected by the present want of vision, will take a different view of this question of supporting local industry, when there is a recognition of the material benefits conferred on the whole community by the local addition to a raw product of the labour necessary to convert it into a manufactured article.

* * * *

Railways and Harbours Expenditure.

The Estimates of Expenditure on Capital and Betterment Works on the South African Railways and Harbours for the year ending March 31, 1915, were laid on the table last week. The programme for the year is allotted as follows:—Completion of lines under construction, £1,500,000; new works on open lines, £1,262,325; rolling stock, £278,704; harbours, £266,066; working capital, £92,904; unforeseen works, £100,000. The chief feature of the new proposals is in respect of Harbours. A new programme, involving an outlay of £3,130,922, is to be inaugurated. This is in addition to the £717,000, being the balance of last year's programme; and in the current year a sum of £266,000 is to be expended. The details of these works show that provision is to be made for a protecting arm and the remodelling of the South Pier Elbow in Table Bay at a cost of £36,000; and the construction of No. 3 (Loch) Jetty, exclusive of electric cranes, at a cost of £109,000, of which £10,000 will be spent in the current year. The work of widening the East Pier will be held over in the meantime, as the former work would provide two deep-water berths, the latter only providing one. At East London, £400,000 is to be applied to the extension of the Breakwater and works on the East Bank, and £29,000 to the further extension of the Quay Wall on the West Band. At Mossel Bay, £21,000 is to be allocated for breakwater extension. At Port Elizabeth an expenditure of no less than a million and a half is to be applied to the extension of the breakwater. At Durban provision is to be made for a new graving dock, at a cost of half-a-million sterling. Considerable sums are allocated to railway workshops, buildings, and materials. The following are the proposals in regard to Salt River:—New boiler shop, £15,500; equipment, £10,000; new power house, including electric plant, £15,000; machinery, etc., £12,000. A sum of £135,000 is entered for the construction of new workshops at Bloemfontein.

* * * *

Liebig's and Rhodesia.

The report presented at the annual meeting of the Liebig's Extract of Meat Co., Ltd., shows that the company has had a prosperous year, the net profit earned being £216,042 19s. 10d. This year the increased preference share capital all ranks for full dividend, absorbing £50,000. The dividend and bonus on the ordinary shares is 22½ per cent., free of income tax, the same as last year. The directors refer to the extremely high cattle prices which ruled during the year, due to the general increased demands in the world for meat; the cattle farms owned by the company have shown very good results; the sales of the company's proprietary foods also continued to expand. Progress is reported in Rhodesia, where a good nucleus stock of cattle has already been collected. Weather conditions were favourable, the cattle are reported to be in very good condition, and the directors' experience so far confirms the opinion that Rhodesia is very suitable for the ranching and cattle industry. The company is evidently in a very strong position. This year £10,000 is added to the reserve fund, bringing it up to £710,000.

Folakara Oil Fields.

The following important cable message has been received from Mr. S. A. R. Skertchly, the Resident Engineer and Oil Fields Geologist, viz.:—"I have made preliminary examination of the Folakara oil fields. Anticlinal structure, abundance of petroleum springs and asphalte constitute most favourable indications. Strongly recommend vigorous development policy. Am firmly convinced success is a foregone conclusion provided that the deep oil-bearing formation is covered by thick impervious bed.—Skertchly." In view of the above important message, subscribers are notified that applications will be allotted in strict rotation.

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THE WEEK IN THE SHAREMARKET.

Firm with Little Business Doing—Awaiting a Lead from London.

Business is still far to seek in the market, though the tone remains healthy enough. The feature of the week has been a firming up in Brakpans on the news of better developments in the bottom levels, and the whole Far East Rand would benefit from any improvement in that property. Tin and diamond shares are lifeless and awaiting news from London. The native labour supply promises satisfactorily; and the speech made by Mr. Wallers at the Chamber of Mines' meeting on Monday ought to have a good effect. Nothing, however, seems able to contend against the prevailing lethargy, and the end of the period of waiting is apparently not yet. Some reaction, at any rate, cannot now be long delayed.

* * * *

	Fri., 19th.	Sat., 20th.	Mon., 22nd.	Tues. 23rd.	Wed., 24th.	Thurs., 25th.
Adair-Ushers	0 5*	0 5*	0 5*	—	—	0 5*
African Farms	10 3	10 3	10 3	10 1*	10 3	10 3
Apex Mines	16 6*	16 3*	16 3*	16 3*	16 3*	17 0*
Aurora Wests	—	—	—	8 9*	8 9*	8 9*
Bantjes Consolidated	—	13 6	—	13 0*	—	—
Blaauwbosch Diamonds	—	—	—	84 6*	—	83 0*
Brakpan Mines	42 6*	43 6*	44 9*	45 0*	47 3*	49 0*
Breyten Collieries	26 0*	26 0*	26 0*	25 0*	25 0*	25 0*
Bushveld Tins	0 6*	0 6*	—	0 6*	0 8†	0 7†
Cassel Coals	15 0*	—	—	—	—	—
City and Suburbans	51 6*	52 0†	52 0	52 0	52 3*	52 0*
City Deeps	64 6*	64 0*	64 6*	64 3*	64 0*	64 3*
Cloverfield Mines	4 0*	4 2*	4 1*	4 2*	4 3*	4 3
Cons. Langlaagtes	—	34 6†	34 0*	—	—	34 0*
Cons. Main Reefs	17 6*	17 6*	17 6*	17 9*	17 9*	17 9*
Cons. Mines Selection	7 0*	—	7 0*	7 3*	8 0*	8 0*
Coronation Collieries	—	18 0*	—	18 0*	18 0*	—
Coronation Freeholds	0 4*	—	—	0 4*	0 4*	0 4*
Coronation Syndicates	—	—	—	—	3 0*	3 0*
Durban Rood. Deeps	18 0*	17 6*	18 6†	17 6*	17 6*	17 6*
East Rand Centrals	1 9*	1 9*	1 9*	1 10*	1 10*	1 10*
East Rand Coals	1 7*	1 7*	1 6*	1 7*	1 7*	1 7
East Rand Deeps	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
East Rand Mining Estates	2 6*	2 6*	—	—	—	—
East Rand Props.	34 3*	33 6*	—	33 0*	33 0*	33 0*
East Rand Debentures	£89*	£89*	£88*	—	£88*	£89*
Eastern Gold Mines	1 0*	1 0*	1 0*	1 0*	1 0*	1 0
Frank Smith Diamonds	3 0	3 0*	2 9*	2 9	—	2 0*
Geduld Props.	24 0*	24 0*	23 9*	23 9*	24 3*	24 6†
Geldenhuis Deeps	23 9*	23 9*	—	—	—	—
Glencoe Collieries	6 0*	6 0*	6 0*	—	6 0*	6 3*
Glynn's Lydenburgs	11 3*	11 0*	—	12 6†	12 6†	12 6†
Government Areas	23 3	23 6	23 6	23 0*	23 3	23 0
Jhb. Board of Executors	23 6†	23 6†	23 6†	23 6†	23 6†	23 6†
Jumpers	—	—	—	4 0†	—	—
Jupiters	—	—	3 6*	3 6*	4 0†	—
Kaalfontein Diamonds	0 3*	0 3*	—	0 3*	0 3*	—
Kleinfontein Estates	20 0†	—	—	—	—	—
Klerksdorp Props.	2 7*	2 7*	2 7*	2 7*	2 7*	2 7*
Knight Centrals	8 3	8 1	7 9	7 9*	7 10*	7 11
Knights Deeps	32 0*	—	—	32 6*	—	—
Lace Props.	3 1*	3 1*	3 1*	3 0*	3 0*	—
Luipaardsvlei Estates	9 6*	9 6*	9 6*	9 6*	9 6*	9 6*
Lydenburg Farms	2 7*	2 7*	2 7*	—	2 8*	2 9
Main Reef Wests	6 9*	6 9*	7 0	7 0*	7 0*	6 11
Meyer and Charltons	116 3*	116 3*	117 0*	117 0*	117 0*	117 0*
Middelvlei Estates	1 6†	1 4*	—	1 4	—	1 4
Modderfontein B.	—	88 3*	88 0*	90 0†	88 0*	87 6*
Modderfontein Deeps	53 9*	54 0	54 0*	54 3*	54 3*	54 6†
National Banks	235 0*	238 0*	238 0*	238 0*	—	238 0*
New Boksburgs	—	0 9*	0 10*	0 10*	0 11*	0 10*
New Eland Diamonds	30 0†	28 0†	—	—	—	—
New Era Cons.	5 3*	5 3*	5 6*	5 6*	5 9*	5 11*
New Geduld Deeps	1 6*	1 6*	1 7*	1 7*	1 7*	1 7*
New Gochs	15 9*	15 9*	15 9*	15 9*	15 9*	16 0*
New Heriots	54 0*	54 0*	54 0*	54 0*	54 0*	54 0*
New Kleinfonteins	22 6*	23 3*	23 6	23 3*	23 6*	23 9
New Modderfonteins	255 0*	255 0*	255 0*	—	—	255 0*
New Rietfonteins	3 0*	—	3 0*	3 0*	3 0*	3 0*
New Unifieds	—	—	—	16 0*	18 0†	—
Orange Diamonds	1 0*	1 0*	1 1	1 0*	1 0*	1 0*
Piggs Peak	9 9*	9 9*	9 9*	9 9*	9 9*	9 9*
Pretoria Cements	—	—	—	44 6*	44 6*	44 6*
Princess Estates	5 6*	6 0	5 9*	6 0	—	6 3†
Rand Collieries	—	1 0*	—	1 0*	1 0*	1 0*
Rand Klips	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Rand Nucleus	1 8*	1 8*	1 8*	1 8*	1 8*	1 8*
Randfontein Deeps	3 6*	3 7*	3 8	3 7*	3 7*	3 7*
Randfontein Estates	19 0*	—	—	19 6*	—	19 0*
Roberts Victors	15 0*	15 0*	15 0*	15 0*	15 0*	15 0*
Robinson Deeps	29 9*	29 3*	—	29 3*	31 0†	30 6
Rooiberg Minerals	21 0*	21 0*	21 0*	21 6	21 3*	21 3*
Roodepoort Uniteds	7 0*	7 0*	7 6*	7 6*	8 0	—
Ryan Nigels	2 9*	2 9	3 0†	2 9†	2 3*	2 6*
Shebas	—	—	4 3*	4 6	4 3*	4 6*
Simmer Deeps	—	1 0*	—	1 0*	1 0*	—
S.A. Gold Mines	—	13 0†	—	—	—	—
S.A. Lands	2 6*	2 6	2 6*	2 6*	2 6*	2 6*
Springs Mines	10 0*	10 0*	10 0*	10 0*	10 3*	11 0
Sub Nigels	10 3*	10 9	10 9*	11 3	11 0	10 6
Swaziland Tins	—	32 6†	—	—	—	—
Transvaal Coal Trust	27 9*	28 6	28 0*	29 0	29 0*	30 0*
Tudors	1 0*	—	—	—	1 0*	—
Van Ryn Deeps	45 3	45 6	45 3*	46 0	45 6*	45 9*
Village Deeps	39 0*	39 0*	39 0*	—	38 9*	—
Village Main Reefs	37 6*	38 0*	38 0*	38 6*	38 6*	—
Vogelstruis Cons. Deeps	—	—	—	0 9*	—	0 9*
West Rand Cons.	8 0*	8 0*	8 0*	—	8 0*	8 6*
Witbank Collieries	42 6*	42 6*	—	43 0*	43 0*	43 0*
Witwatersrands	70 0*	71 0*	71 0*	71 6*	71 6*	71 0*
Witwatersrand Deeps	48 6	49 0*	49 0*	50 0†	—	48 6*
Wolhuters	14 3*	14 3*	14 0*	14 0*	14 0*	14 0*
Zaaiplaats Tins	23 0*	23 3*	22 9*	23 0*	24 0*	23 9*

*Buyers. †Sellers.

The new Union 4 per cent. Loan was quoted at £98 12s. 6d. buyers, and the Union 3½ per cent. Loan at £96 10s. buyers.

*Buyers. †Sellers.

Income and Taxation.

The *Cape Times* has the following: We pointed out the other day that the distinction between the revenue which the Government derives from its part ownership in the Premier Diamond Mine and from taxation, was clearly and explicitly recognised in the House of Assembly in 1910 by representatives of all parties: the Minister of Finance (then Mr. Hull), Sir Percy Fitzpatrick, and Mr. Creswell. This in answer to an extraordinary suggestion in our morning contemporary that such a distinction was quite novel, and could only have been invented for the purpose of discriminating against the Premier Mine and in favour of De Beers and the gold mines. So far as the Income Tax Bill now before Parliament is concerned, the point is scarcely likely to be pressed again, though General Smuts hinted last night that it might be raised. It is worth pointing out, however, that the distinction in question between income and taxation was not only admitted on the Treasury Bench by Mr. Hull in 1910, but is officially recognised in the White Paper containing the estimates of revenue for the current financial year. There, under the summary of revenue from mining, we have the total of £2,357,000, divided into £1,485,000 from "taxation," and £872,000 from "income from public estate." Turning to the details of this £872,000 and £1,485,000, we find the following table:—

Mining: Government ownership revenue:	
Diamond mines	£400,000
Gold mines (bewaarplaatsen)	190,000
Other mines	12,000
Licences and mynpacht dues	270.000
Taxes on mining:	
Diamond mines	400,000
Gold mines	1,050,000
Other mines	35.000
Total	£2,357,000

In other words, the Treasury White Paper shows that the amount which the Government expects to receive from the 60 per cent. ownership in the Premier Diamond Mine is not taxation at all, but Government ownership revenue.

I want my pessimistic readers to take a glimpse into Kroonstad's distant (very distant) future, says a writer in the local paper. They will see in the place of our present insignificant dorp a large coal-begrimed city, with hundreds of coal mine headgears dotted all over the commonage, a proper Eldorado of Central South Africa. That is the picture of the future Kroonstad, because the Council was informed that reliable indications of the existence of a bed of coal have been discovered on the town commonage, and that in one particular place it is likely that the coal may be reached not far from the earth's surface. Needless to say, the Council was unanimously agreeable, under specified conditions, that a prospecting contract be entered into for the search of this precious black wealth on the town lands, and, of course, if found, Kroonstad will be made a place the envy of even Bloemfontein.

S.W. Diamond Fields.

The returns of diamonds from the alluvial fields of the South-Western Transvaal for May month are to hand, and from the summary given below it will be seen that the combined totals of the thirty-nine fields producing amounted to 4,226⅜ carats, value £18,738 18s. This represents a slight increase upon the output for the previous month, the figures for which were 4,196¼ carats, value £18,415 6s. 6d. The returns may be summarised as follows:—

	Carats.	Value.
Bloemhof	753⅜	£3,536 17 0
Cawood's Hope	405¾	2,291 15 0
London	543	2,274 17 0
Kameelkuil	420⅛	1,955 0 0
Eastleigh	293⅞	1,430 17 6
Kareepan	312⅝	1,317 2 6
Panfontein	374¾	1,167 7 6
Dievedraai	250¼	1,161 7 0
Rietput	75	448 12 6
Driekopjes	90½	337 0 0
Rondevlei & Doornbult	95¾	315 0 0
Eerstebegin	34½	284 10 0
Diamantdoorns ...	51¼	268 17 6
Christiana	44¼	256 0 0
Avondster	55¾	209 17 6
Mooifontein	67¼	191 0 0
Modderkraal	41¼	183 15 0
Kromellenboog	36	168 10 0
Koppiesvlei	49¾	151 5 0
Kuilfontein	46¾	127 0 0
Olivenfontein	33	122 5 0
Zevenfontein	26½	118 0 0
Kareepan 137	18⅜	87 10 0
Grootdoorns	12	76 0 0
Goedgenoeg	17	45 19 6
Uitkyk	13¼	45 0 0
Zwartlaagte	16¾	42 12 6
Maroetjesfontein ...	10	21 15 0
Doornbult	5¼	20 0 0
Homansvlei	4½	17 0 0
Weltevreden	7¾	15 10 0
Mooiplaats	3¾	12 5 0
Klipfontein	3¼	10 15 0
Blesbokfontein	1½	9 0 0
Wolvenspruit	3	7 10 0
Mamusa	1¼	4 0 0
Hamburg	1¼	3 0 0
Kaalpan	5¼	2 15 0
Smitkraal	1	1 10 0
	4,226⅜	£18,738 18 0

Glencoe (Natal) Collieries.

The Glencoe (Natal) Collieries have declared an interim dividend of sixpence per share, being at the rate of 2½ per cent. for the half-year ending 30th June.

The latest quarterly report of Rand Mines, Ltd., shows that Mr. E. A. Wallers is now managing director of that Corporation.

It has been announced that the Corporation of the City of Capetown are prepared to provide a central and suitable site for the erection of a technical institute, and it is estimated that the cost of the proposed building will be £25,000.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

June 30.—A. Goerz & Co., Ltd. (annual); Robinson G.M. (annual).
July 21.—New Kleinfontein Co. (special).
Aug 10.—Jumpers (Special).
Sept. 1.—Jumpers (Special).
Sept. 18.—Transvaal G.M. Estates (annual).

Swaziland Progress. Recent progress in Swaziland is thus described by the *Lourenço Marques Guardian*:—The Lowlands, it says, will improve year by year after the introduction of large herds of cattle. That such is well in prospect is evidenced by the fact that the Swaziland Ranching and Development Company, controlled entirely by practical Natal stock-farmers and owning 160,000 acres, is the pioneer of a very extensive ranching movement. Their ground lies between the Maputa (or Usutu) River and the old road running from Tembe Drift to the Transvaal. Served by four rivers, with a water front of 39 miles, and fine pasture ground, this company has excellent prospects, its cattle already exceeding 1,500 head, with the intention of ultimately increasing the stock up to 10,000. Stock, however, is not all; the company intends, we hear, when once railway connection is established, putting down all its river fronts under tobacco and citrus fruits. The Eckstein group have also a large block of land adjoining the Swaziland Ranching Co., where already a number of cattle, bred for years by Mr. David Forbes, are running and constitute a very fine nucleus for a big outfit. North again of this comes the property of Ranchers, Ltd., with the Komati River as its northern, and the Umbeluzi as it southern boundary. Ranchers are importing stock from the Orange Free State Province. Finally, on the north of the Komati is Mr. Seaton Guthrie's ranch, which completes a chain of nearly one hundred miles of stock farms on that portion of Swaziland almost abutting on the Portuguese frontier. On the magnificent water fronts, aggregating something like 130 miles, there is little doubt that tobacco, citrus, and other industries will spring up so soon as the Portuguese railway is extended into Swaziland territory, and the far-sighted genius who engineers this wise and statesmanlike sign of progress will deserve well of the coast and trans-Lebombo communities.

→ 3 ←

FACTS REGARDING THE

TRANSVAAL

WORTH REMEMBERING.

1. The **TRANSVAAL** is producing over one-third of the World's Gold Output.

2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant.

3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Manager's Association.**

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

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CONTENTS.

PAGE

Notes and News 485
Topics of the Week:
  The General Mining and Finance Meeting ... 487
  Position and Prospects of the New Jagersfontein 488
The Half Year's Dividends 489
Manager and Staff of the Van Ryn Deep 490
Welfare Work on the Main Reef—II. 491
Progress of the Barnato Group 492
The Pattern Tin Dressing Plant of the Transvaal 493
Transvaal Mining and the Panama-Pacific Exposition 494
The Outlook for Tin Prices 496
The Year with the T.G.M. Estates 497
South African Association of Analytical Chemists 498
Correspondence and Discussion: "Shall the Tin Mines Close Down?"; "The Economics of Citrus Growing" 499
Rhodesian Section:
  Latest Mining News 501
  Rhodesia's Mineral Output 502
Engineering Notes and News 505
  Progress of the Kononax Drill ... 505
The Week in the Sharemarket 506
Automobile Notes 508

Notes and News.

The Goerz Meeting.

A full report of the annual meeting of Messrs. A. Goerz and Co., Ltd., will be found elsewhere in this issue. Mr. Neuhaus, who presided, was severely businesslike in his remarks, and only once—in regard to "N.R.C.," referred to by us elsewhere—did he let himself go on general questions. His review of the position at the several mines of the group lost nothing, however, by its conciseness. The Geduld and Modder Deep are both doing excellently, and the parent company has arranged their finances on a broad-gauged and generous line. Its reward, we have no doubt, will be commensurately great. Naturally, the Mexican interests of the company have been a source of grave anxiety in the past year, but we will refrain from pointing the obvious moral. As far as the Rand is concerned, Messrs. Goerz and Co. would now seem to have turned the corner, and the prospects for the future seem brighter than at any time during recent years. The utmost energy and progress characterise the management of the mines of the group, and we have nothing but praise for the manner in which the Geduld and Modder Deep have been brought to their present satisfactory stage.

* * * *

Progress of Luipaardsvlei.

The position of the Luipaardsvlei Estate has, of late, vastly altered for the better. The two new tube mills have now started work, and the profits are steadily increasing from the larger tonnage crushed. From now onwards crushing will be gradually increased up to 21,000 tons per month. On the Battery Reef in the Eastern section of the property an old vertical shaft has been dewatered, and at a depth of 240 feet reached disclosing a number of drives and stopes ready for attack. It has been decided to instal a headgear here immediately, in order to haul rock from this section by September next. These workings date back to 1896, when the reef was worked by the Fern Syndicate. Credit for opening up this promising area must be given to the energetic policy of the new management. The cash position of the company is eminently satisfactory. It is expected that a dividend will therefore be declared at an early date. Since the above was written the following circular has been received:—

> I am directed by the board to inform shareholders that, as announced in the Press, cable advice has been received from South Africa to the effect that the two new tube mills have commenced running. It is expected that the tonnage crushed will thereby gradually be increased from the present figure of about 17,000 tons per month to approximately 21,000 tons per month, with a proportionate increase in profits, after allowing time for the usual absorption of gold. The mine generally continues to open up satisfactorily; further exploration of the recently re-opened old workings on the Battery Reef in the Windsor section is of a very encouraging nature. The shaft to the 240 feet level, which has recently been dewatered, has disclosed drivs and small stopes available for cheap quick prospecting and speedy development of the first three or four levels. A headgear and hauling engine are now being erected to admit of work being advanced on this section at the earliest possible date. A new winze has been sunk to a depth ofg 75 ft., disclosing an average assay value of 11·7 dwts. over 33½ inches. Instructions have been given to the Johannesburg office to complete as soon as possible the accounts for the financial year ended on the 30th ultimo so as to enable the annual general meeting of the company to be held at an early date. In the meantime I am directed to state that the profits earned during the year now closed and the satisfactory cash position of the company will justify the board in recommending to shareholders the declaration of a dividend at the forthcoming annual general meeting.

* * * *

Held Over.

Owing to pressure on our space this week, caused by the deluge of company meetings reported in this issue, we have been compelled to hold over comments on Mr. Buckle's report, Mr. Williamson's financial proposals, and the shareholders' speeches at the Robinson meeting. In the case of the first-named, at any rate, it may be better to await the receipt of the complete report, before reading into the telegraphed summary an indictment of the industry which is not justified.

New Cement Works.

Speaking at the annual meeting of Henderson Estates, Lord Ormmore and Browne said:—" In regard to our investment in the new cement company in South Africa, the working company to carry out this has now been formed under the name of White's South African Cement Co., Ltd., and, as you will notice from the report, the factory is expected to be in running order by the end of July. We cannot report anything further to you in regard to this at present, but we trust that when we meet again this undertaking will have justified its creation."

* * * *

The Harrisdale Diamond Syndicate.

In reply to enquiries regarding the affairs and assets of this syndicate, the following notes supplied officially should be of interest. The capital of the Syndicate is (issued) £32,500 in 5s. shares. The Syndicate (1) holds contract over Harrisdale Estates, 20 sq. miles, 18 miles N. of Kimberley, with right to purchase certain portions on discovery of payable mines. (2) Holds mining lease from O.F.S. Government of the farm Zoet-en-Zuur, situated between the Elands and Blaauwbosch mines. (3) Contract over northern portion of Rietfontein 1638, in extent 770 morgen, 11 miles from Naboomspruit Station. This contract is of three years' duration, with rights to mine and purchase for £7,000. (4) Contract over Tamsen's portion of Welgevonden (168 morgen), period two years; right to mine and purchase for £1,500. The following remarks supplied officially in regard to these are of interest: (1) Extensive boring has been done by the Syndicate for water and active winning of diamonds from the large areas of alluvial is now commencing. Mr. Rivas reports, under date June 28, that he will have a trial wash on Monday on a likely-looking area. (2) The manager reports 200 loads yellow ground ready for washing. Washing started July 1. Expected to yield about 40 carats to 100 loads, value 32s. 6d. per carat. Work is about to be commenced on the line of fissure between the Elands and the Blaauwbosch on this property. (3) Work on this has been stopped for the present in order to concentrate work on the other properties. (4) The development on the tin lode on this property is opening up wide and rich bodies of ore. The manager reports, under date June 27, as follows: " I am pleased to report that the east side of shaft has improved considerably, and now pans 7 per cent. across 30 inches top seam or hanging of drive, the next seam pans 2 per cent. across 3 feet, making 5 feet 6 inches in all. The lode in west drive now appears to be dipping south; pannings from this side are still good, the hanging portion across 2 feet goes 8 per cent. The next seam or middle, across 3 feet, 2½ per cent., the bottom seam on the foot ¾ per cent. In reply to letters, the directors would like to state that the fullest information and latest reports can always be seen at the offices of the Syndicate by anybody interested, and that any shareholders, engineers, members of the Press, or anybody else can see any one or all of the properties at any time." It might be added that one can hardly expect more for 1s. 8d. (the present price of the shares) than the assets enumerated above.

* * * *

A Defence of the N.R.C.

The speech of Mr Neuhaus at the annual meeting of Messrs. Goerz and Co., Ltd., contained a strong tribute to the success of the N.R.C., Ltd. That tribute will doubtless be all the more welcome to those concerned because of the disappointment that has lately been expressed with it in other influential quarters. Thus at the annual meeting of the Central Mining and Investment Corporation in London recently, the Chairman, it will be remembered, said the N.R.C. had not yet fulfilled all expectations. It is not easy, of course, to judge correctly in a matter like this from six thousand miles away, though most of us would be slow to differ from so well-informed an authority on a matter of this sort. However, Mr. Neuhaus thinks an injustice has unwittingly been done to those responsible for the formation and management of the new organisation, and his defence of it we frankly confess, is very convincing. Of course, it was not so much the saving that could be effected on existing recruiting charges as the fact that it put a stopper on the *growth* of those charges consequent on the insensate competition for labour by the groups that formed the chief function and merit of the organisation. Mr. Neuhaus brought out the point clearly, and in so doing, we believe he has done an act of common justice to the " N.R.C." and elucidated a matter of importance to all connected with the industry.

* * * *

Leeuwpoort.

Elsewhere in this issue will be found a description of the very efficient ore reduction and dressing plant at the Leeuwpoort (African Farms) Tin Mine. It is unnecessary to include a description of the mine itself, as that was fully dealt with in the detailed report of the manager printed in our columns a few weeks ago. Apart from the very modern surface plant, a feature of the property is the adoption of the recommendation made by General Gorgas for the housing of mine natives. As a fact, the Leeuwpoort people anticipated General Gorgas by providing separate, solid and substantial rondavels for their married mine natives, with the result that the mine is now never short of labour. The mine village on the property is, indeed, a model of cleanliness, comfort, and dusky contentment, and Rand compound managers might learn much by paying it a visit. We had hoped to reproduce a photograph of it, but the fiendish and insatiable zeal of the modern hand camera for insisting on making one plate do the work of two has temporarily defeated that desire.

* * * *

The Gold Mines of the T.C.L. Company.

The extent and importance of the mineral interests of the Transvaal Consolidated Land and Exploration Company, are not perhaps adequately appreciated, but a reference to the speech delivered by Mr. H. Eckstein at the annual general meeting of the company, held on Tuesday, should make it clear that, although there have been some disappointments in regard to the gold, and although the fall in the price of product has adversely affected the base metal concerns, there are, nevertheless, undoubtedly great possibilities in these outlying and scattered mineral ventures of the T.C.L. Company. First of all, in regard to the gold mines, it may be observed that whilst results at Rietfontein have not come up to expectations (last year's working profit being only £2,678, or 4s. 4d. per ton milled), the Fairview Company appears to have largely overcome the difficulties attending treatment of the ore. The T.C.L. has had some complex problems in regard to the treatment of refractory ores to deal with in the Eastern Transvaal, and it is encouraging to note that since the installation of the new plant at Rietfontein in July last, good profits have been secured. Last year 16,385 tons were crushed, yielding a profit of £6,550, or 8s. per ton, and during the first five months of the current year 8,280 tons were put through the mill at a profit of half a sovereign per ton. A considerable amount of prospecting work has been done by the company in the Barberton district, but such gold-bearing reefs as have been located have not been of sufficient extent to induce the directors to incur further expenditure in opening them up. The company is, however, still prospecting a block of 882 claims, which looks rather more promising.

* * * *

The Base Metal Ventures.

More interesting, however, than the gold ventures are the base metal undertakings of the T.C.L. Co., and of these the property that attracts most attention is the zinc property in the Marico district, inasmuch as a 60 ton per day plant has been ordered for it, this being the first equipment for the treatment of zinc ores to be installed in the Union of South Africa. A little work has been carried out in N.W. Rhodesia on mixed zinc and lead ores, but this was mainly of an experimental nature and the greatest interest attaches to the metallurgical operations of the Blane-Witkop Company. The estimated cost of the equipment will be £16,160. In regard to tin the Groenfontein Mine has so far been the outstanding bright spot. Of this concern Mr. Eckstein recalled that the Chairman referred last year to the fact that a body of ore had been uncovered by means of the hydraulicing operations. This deposit, known as the Giant

Workings, has for the twelve months ended the 31st ult. produced ore containing 367 tons of 70 per cent. concentrates, and has, in fact, been the main contributor to output. While there are favourable indications here and there, other development work has on the whole not opened up any important ore bodies. The Giant Workings faces have also lately gone off in value. "In view of the extent of this property," remarked Mr. Eckstein, "it is reasonable to expect that history will repeat itself, and that, although the outlook is not quite so bright at present, we may at any moment come across fresh bodies of profitable ore. Up to the end of last year the mine had yielded a net profit of £80,820, after repaying all capital expenditure. Owing to the recent heavy fall in tin, it has been decided to reduce the output to the minimum required to balance current expenditure, plus cost of development, which it is very desirable to continue." As to the Swaziland Tin, Ltd., owing to the serious fall in the price of tin, the profits earned since the beginning of this year will, of course, be far below expectations, and, for the same reason, the dividend for this half-year had to be passed. Expenditure has been curtailed in various directions, and if there is no further appreciable decline in the price of the metal, the mine should continue working at a profit. At Witfontein and Newburg, in the Waterberg district, 3,000 tons of tin ore of an average grade of 2 per cent. of 70 per cent. concentrate and 3 per cent. of copper has been exposed, and a further 2,000 tons of the same value have been dumped at grass. At Weynek no work is now being done and at Mutue Fides work has had to be curtailed on account of shortage of labour and malarial fever. Here, however, 1,681 tons of tin ore, containing 180 tons of 70 per cent. tin have been developed. As to the Roodepoort and Zaaiplaats leases negotiations for an extension of the first-named lease are proceeding, whilst in regard to Zaaiplaats lease the ore accumulated at grass as at 31st December, 1913, was estimated to contain 17·68 tons of 70 per cent. concentrate. Owing to scarcity of native labour it has not been possible to do much underground work since the latter part of last year, but active development has now been resumed. Testing of the alluvial soil is also proceeding. Mr. Eckstein admitted that some of these ventures do not look very promising at present, but given a rally in the tin market the company should yet obtain profitable results from its tin mining operations.

* * * *

Oil Finding.

Sir Boverton Redwood, the petroleum adviser to the British Admiralty, Home and Colonial Office, etc., has written a short introduction to Mr. Cunningham Craig's book on "Oil Finding," and he hails it as a successful attempt to deal with a subject which has hitherto received far too little attention. He points out that those who have within recent years had occasion to deplore the waste of money which has resulted from the publication of malicious reports on lands presumed to be oil-bearing in various parts of the world, and from the unscientific manner in which drilling operations have been conducted, will regret that this book was not published long ago. With the aid of this book, he says, those who contemplate investment in petroleum undertakings may place themselves in a position to form an independent opinion as to whether the technical data given in a prospectus are such as to justify the appeal for subscriptions. Similarly the shareholders in petroleum projects, which are of an exploratory nature, may learn to interpret reports of progress which at present they find unintelligible. We in South Africa may remember that Mr. Cunningham Craig was the expert whom the Union brought out to advise us on the prospects of finding oil in, this country; and his report, though somewhat discouraging to some existing exploratory projects, indicated in a general way the localities in the Union where further investigation should be made; and at the same time drew attention to the kindred proposition of the exploitation of the oil-bearing shales, which partakes more of a mining character, and is distinct from the search for oil wells. This book is consequently of interest as presenting to us some of the general principles which guided this expert in the opinions which he expressed in his report, and giving us an insight into the scientific data upon which his conclusions were based.

TOPICS OF THE WEEK.

THE GENERAL MINING AND FINANCE MEETING.

Sir George Albu is nothing if not a fighter, and his speech at the General Mining meeting revealed him at his best as a cool and clear-eyed optimist in face of all the discouragements of last year. That speech, which is fully set out elsewhere in this issue, forms at once a succinct and informative *résumé* of the position and prospects of the mines of the group and a valuable review of the outstanding features of the year. The big serious item of depreciation amounting to £833,236 in the accounts of the parent company, he showed, on analysis, to be due to the drop in the prices of two of the subsidiaries, Cinderella and Rand Collieries, which drop was due, in turn, to the exaggerated depression that was wont to attach itself to the shares of any mine closing down for whatsoever reason and for however short a time. We all know that the greater part of that falling off in price and consequent depreciation in market values would be quickly recovered on the re-appearance of conditions favourable to the restarting of operations at the mines in question. And we are glad to notice that Sir George Albu is convinced that the return of those conditions is only a question of time. Moreover, the whole tone of his speech is such as to confirm that view. Sir George no longer displays any marked points of difference with other industrial leaders on such burning topics as labour and water supply; and his remarks are of the smooth, frictionless, easy sort that oil the wheels of high finance. In other words, Sir George sees that nothing but peaceful, commonsense co-operation between the State, Labour and Capital is required to put this industry and this country back on the high road to prosperity, and he for his part is leaving nothing undone to promote the coming of that spirit. There is a pathetic note towards the close of Sir George's speech, where he refers with regret to the abandonment of his hopes of public life, owing to his self-denying resolve to let nothing interfere with his direct, personal attention to the affairs of the group. Here, we think, Sir George is unjust to himself by underrating his present importance to the State as a captain of industry. His presence and his personal grip of the helm of the industry cannot but be a big factor in its present stability and its future progress; and it is a truism that in serving the interests of the Rand he is serving the interests of all South Africa and its people. "My energies will in the future," said Sir George, "continue to be concentrated on striving to again place, and afterwards maintain, the corporation on a thoroughly sound basis in every respect. It has been said that difficulties are only made in order to be overcome. Well, we have conquered many difficulties in the past, as witness some of the most successful of the mines to-day under our control, which, in coming under our management, were apparently hopeless failures, and I have sufficient faith and confidence to feel that we shall eventually work successfully through our present troubles." We agree with Sir George that the main points in his review of the year certainly indicate a more cheerful view than was possible at the close of the past year. He shows that the prospects of obtaining and maintaining an adequate supply of native labour appear to be good, taken in conjunction with the undoubtedly more efficient and labour-saving character of the latest types of machine drills recently introduced. He is hopeful of a better understanding between white employees and the managements, which will make for more stable and contented conditions as regards white labour. The question of water supply, which has always been a more or less difficult problem on these fields, he thinks likely to be satisfactorily and permanently solved in the near future. With these important matters on the road to settlement, he opines that the mining industry should soon begin to show a distinct advance. As far as his group is concerned, he emphasises the improving returns now being made by the Meyer and Charlton, the New Goch, and the Aurora West, and the good prospects of better results being obtained from the Roodepoort United and West Rand Consolidated. The spect of all these improvements, and in particular the recommencement of operations at the Cinderella when effected, on the fortunes of the corporation is certainly obvious. Sir George concluded with some noteworthy remarks. "My brother and I are by far the largest shareholders of the corporation," he said, "so that our interests are intimately bound up with its success. I give you my solemn assurance, however, that the depreciation in value of our respective holdings does not weigh with us for a moment in our sincere expressions of regret in connection with the accounts for the past year. We founded the corporation, and we have for close on twenty years worked our hardest for its prosperity. In regard to the misfortunes with which we have been visited during the past few years, these have been due to the fact that some of the mining propositions in which we are largely interested have not up to the present developed so well as we had every reason to anticipate when entering on them, or, alternatively—as in the case of the Cinderella Consolidated—because our development schemes have had to be suspended owing to the exhaustion of funds at a time of extreme depression in which it was impossible to obtain further capital. The first-named reason needs no explanation; it is one of the risks inseparable from mining all the world over. As regards the abnormally depressed condition of the money markets during the past two years, this was a condition of affairs which no one could foresee." Sir George's speech is plainly something more than a mere *apologia* for his stewardship in a bad year. It is a striking confession of faith in the future of the Rand—a confession that rings forceful and true, and that should of itself go far to hasten the return of confidence and good times now sadly overdue.

POSITION AND PROSPECTS OF THE NEW JAGERSFONTEIN.

Despite severe and unprecedented native labour shortage, owing to the exceptional events of the year, the New Jagersfontein position and prospects, as disclosed at the annual meeting last week, remain excellent. The detailed statements regarding the operations of the year show a decrease of 1,241,755 in the number of loads of blue ground hauled, chiefly attributable to the interference with native labour. On the other hand, the loads of ground washed were 229,630 more, largely due to the increased proportion of unpulverised lumps requiring to be dealt with, in consequence of the drought. Taking hauling and washing together, the working costs, by reason of the circumstances stated, increased to 4s. 1·59d. per load, as against 3s. 3·69d., while the yield, owing to the severe drought and the insufficiently pulverised state of the blue ground, was 8·90 carats per 100 loads, as against 9·90. In this connection it is satisfactory to note, as pointed out by Colonel H. S. Harris in seconding the adoption of the directors' report, that since the beginning of the present financial year the cost per load of hauling and washing has gone down again almost to normal, i.e., to 3s. 5d., as against 3s. 3·69d. for 1912-13. The stock of blue on the floors at the close of the financial year amounted to 2,743,080 loads, as compared with 2,953,670 at the corresponding period last year, or a decrease of 210,590, part of which reduction, the general manager explains, is represented by ground returned to the floors as hopperings, but not averaged or taken into the account. This stock of hopperings, estimated last year at 700,000 loads, has increased to 817,540, so that on the whole the diminution in the blue ground reserve, as the Chairman points out, is a merely nominal one, and he states further that since the commencement of the new financial year the hauling of blue ground has considerably improved. The expenditure on mine and floors for the year was £712,157 5s. 11d., against £591,081 10s. 8d., an increase of, roughly speaking, £121,000. General charges show an increase of about £8,000, partly due to the additional expenditure entailed by the native disturbance. The expenditure of the year was also considerably increased by the carrying out of substantial improvements in connection with the native compounds. The net result of the company's operations was a production of diamonds amounting to 330,523¾ carats, as against 363,397½ the year before, which realised £1,161,660 12s. 6d., as compared with £1,259,983 3s. 2d. The prices received were: For ordinary diamonds, 75s. 0·02d.; for hopperings, 56s. 3·93d.; and for old sortings, 9s. 7·70d., as against 72s. 10·74d., 55s. 11·19d., and 14s. 3·27d. respectively, showing that prices were more than maintained, and for ordinary diamonds, which represent the bulk of the company's production, were 4 per cent. higher than for the preceding year. The profit for the year, after providing for the sum of £32,918 13s. for depreciation, amounted to £351,698 4s. 11d. Dividends paid amounted to £318,750, and provision having been made for the profits tax, there is a balance carried forward of £292,872 11s. 6d., which is £1,300 more than for the previous year. Given a normal season's rainfall, and an uninterrupted sufficiency of labour, the next annual report will again show more uniformly satisfactory results. It is reassuring to note that since the close of the financial year now under review native labour has been plentiful and satisfactory, and there is no reason to anticipate that the special difficulties encountered during that period will recur. The drought, unfortunately, continues, and to some extent may militate against the operations of the present financial year. A more important factor, however, is the condition of the diamond market, which, as is well-known, has of late been a good deal depressed. The essential point for the shareholders of the Jagersfontein company to note is that the relative increase in working costs and decrease in yield shown in the present report have been chiefly due to exceptional circumstances, concerned entirely with the work of this particular year. With a restoration of normal conditions of working, and a resumption of activity in the market, shareholders may anticipate with every confidence that the figures for the present financial year will reflect a return of the old prosperity.

Rezende Mines.

At the annual meeting of the Rezende Mines, Mr. Sidney H. Farrar stated that the returns were being well maintained, with average monthly profits of £2,650. The ore reserves show an increase of over 50,000 tons, and now stand at 273,612 tons. It is believed that this figure will be largely increased in the near future, as in the Central section the main incline shaft is within 30 ft. of the 1,020 ft. level, and this level, it is anticipated, will yield some 50,000 tons of ore. A cross-cut was put through the Reef last March, and gave average values on the hanging wall of 7·7 dwts. over 66 inches, and 3·5 dwts. over a total width of 156 inches. In April it was reported that the 1,020 ft. level had been driven 65 ft., the reef assaying 10·3 dwts. over 65 inches. Reef disclosures such as these clearly show that the predictions as to increasing reserves are merited. Mr. Farrar spoke hopefully as to native labour, stating that it had been in excess of the mine requirements. Owing to careful treatment the rate of mortality was decreasing, accidents had been fewer, and, generally speaking, the natives were more contented. The financial position of the company is also satisfactory, and a final dividend of 7½ per cent., or 1s. 6d. per share, was declared.

* * * *

Water-fed Hammer Drills.

In the course of his annual report, Mr. J. J. Wessels, the manager of the Robinson Deep, makes the following interesting remarks:—"The great object aimed at on the Robinson Deep for the last four years has been to save labour by the use of machine drills and it is gratifying to note that this line of experiment is being generally taken up. During this year we have had four recent types of water-fed hammer drills in use. Some of them, while capable of producing good results, are not uniformly reliable, and maintenance is very expensive. The making and sharpening of steel is twice as expensive as with reciprocating machines. At present it seems as if the merits of the water-fed hammer drill still require complete demonstration." This is very serious criticism of the water-fed hammer drill, coming from such an authority, and it will be interesting to see how those chiefly concerned will reply to it.

THE HALF YEAR'S DIVIDENDS.

A Grand Total for Transvaal Gold Mines of £4,212,950—The Rand, Despite Difficulties, Records an Advance on the First Half of 1913.

Hereunder we give our usual six-monthly dividend list. The distributions contained in the accompanying schedules were declared during the six months ended with June 30th last and comprise all the gold mining enterprises of the Transvaal that announced dividends during the half year. Distributions of financial corporations are not stated, as these, to a large degree, duplicate the payments made by subsidiary companies. The totals for the half year stand as under:—

Gold Mines:	
The Rand	£4,052,449
Outside Districts	160,501
Total	£4,212,950

Dealing first of all with Rand gold mines, the totals, according to controlling houses or groups, are as under:—

Central Mining	£2,374,194
Consolidated Gold Fields	312,176
Anglo-French Exploration Company ...	57,577
Consolidated Mines Selection	93,750
Johannesburg Consolidated Investment Company	473,017
General Mining and Finance	182,500
S. Neumann & Company	182,468
Robinson	44,325
Natal Companies	136,500
Independent Company	12,500
East Rand Proprietary	183,442
Total	£4,052,449

For the corresponding period of last year group totals were:—

Central Mining and Investment ...	£2,160,782
Natal Companies	142,250
Consolidated Gold Fields	155,141
Consolidated Mines Selection	150,000
Johannesburg Consolidated Investment	276,656
General Mining and Finance	185,000
S. Neumann & Company	182,468
Robinson	381,014
A. Goerz & Company	14,438
Independent Companies	17,500
Total	£3,965,549

For all Transvaal gold mines the increase is £48,809, and for the Rand £86,900. For outside districts gold mines the total is £160,501, a decrease of £38,091, as compared with the first six months of 1913.

Company.	Issued Capital.	Date of Declaration.	Rate per Cent.	Rate per Share.	Amount.	Total Distribution for Year to Date.	Amount Half Year, June, 1913.	Amount Half Year, Dec., 1913.
THE RAND.								
Central Mining and Investment Corporation.								
Bantjes Consolidated ...	£502,306	June	2½	6d.	£12,557	£12,557	£25,115	£12,557
City Deep	1,250,000	June	11¼	2s. 3d.	140,625	140,625	125,000	93,750
Crown Mines	940,106	June	55	5s. 6d.	517,058	517,058	517,058	517,058
Durban Roodepoort Deep..	440,000	June	3¾	9d.	16,500	16,500	22,000	—
Ferreira Deep	980,000	March	25	5s.	245,000	245,000	245,000	245,000
Geldenhuis Deep	585,753	June	8¾	1s. 9d.	51,253	51,253	58,575	43,932
New Modder	1,400,000	June	15	12s.	210,000	210,000	210,000	210,000
Nourse Mines	827,821	June	8¾	1s. 9d.	72,434	72,434	68,985	82,782
Modderfontein B.	700,000	June	25	5s.	175,000	175,000	140,000	175,000
Robinson	2,750,000	June	9	9s.	247,500	522,500	220,000	192,500
Bonus	2,750,000	June	10	10s.	275,000			
Rose Deep	700,000	June	20	4s.	140,000	140,000	175,000	122,500
Village Deep	1,060.671	June	10	2s.	106,067	106,067	106,067	53,033
Village Main Reef	472,000	June	35	7s.	165,200	165,200	165,200	165,200
Companies with Head Offices in Natal, managed by the Central Mining and Investment Corporation.								
City and Suburban	1,360,000	June	7½	1s. 6d.	102,000	102,000	102,000	102,000
New Heriot	115,000	May	30	6s.	31,500	31,500	10,250	10,250
S. Neumann & Co.								
Consolidated Main Reef ...	924,364	June	5	1s.	46,218	46,218	46,218	46.218
Wit. Deep	550,000	June	15	3s.	82,500	82,500	82,500	110,000
Wolhuter	860,000	April	6¼	1s. 3d.	53,750	53,750	53,750	32,500
East Rand Proprietary ...	2,445,897	June	7½	1s. 6d.	183,442	183,442	305,737	305,737
Anglo-French Exploration.								
New Kleinfontein	1,151,540	June	5	1s.	57,577	57,577	—	72.750
General Mining and Finance Corporation.								
Meyer and Charlton	200,000	June	35	7s.	70,000	70,000	60,000	80.000
Van Ryn	500,000	June	22½	4s. 6d.	112,500	112,500	125,000	112,500
Consolidated Mines Selection.								
Brakpan Mines	750,000	June	12½	2s. 6d.	93,750	93,750	150,000	93,750
Robinson Group.								
Langlaagte Estate	886,500	June	5	1s.	44,325	44.325	66,487	22.162

Company	Issued Capital.	Date of Declaration.	Rate per Share.	Amount. Half Year. June, 1912.	Total Rate for Year.	Total Distribution for Year.	Rate.	Total Amount for Last Year.
JOHANNESBURG CONSOLIDATED INVESTMENT COMPANY.								
Consolidated Langlaagte	950,000	June	10	2s.	95,000	95,000	—	95,000
Ginsberg	210,000	June	10	2s.	21,000	21,000	36,750	36,750
New Primrose	325,000	June	20	4s.	65,000	65,000	97,500	97,500
New Unified	250,000	June	10	2s.	25,000	25,000	25,000	25,000
Van Ryn Deep	1,196,892	June	12½	2s. 6d.	149,611	149,611	—	89,767
Witwatersrand	469,625	June	25	5s.	117,406	117,406	117,406	117,406
CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA.								
Knights Deep	743,526	June	5	1s.	37,176	37,176	80,441	37,176
Robinson Deep	1,000,000	June	12½	2s. 6d.	125,000	125,000	150,000	125,000
				1s.	150,000	150,000	225,000	187,500
Simmer and Jack	3,000,000	June	5					
INDEPENDENT COMPANIES.								
Durban Roodepoort	125,000	May	10	2s.	12,500	12,500	12,500	18,750
OUTSIDE DISTRICTS.								
Glynn's Lydenburg	170,000	Jan.	10	2s.	17,000	17,000	17,000	—
Sheba	269,738	Feb.	5	1s.	13,487	26,973	33,718	13,487
	269,738	June	5	1s.	13,487			
Transvaal G.M. Estates	604,225	April	17½	3s. 6d.	105,739	105,739	120,845	120,845
Sub Nigel	131,580	June	2½	6d.	10,789	10,789	10,789	10,789

THE MANAGER AND STAFF OF THE VAN RYN DEEP, LTD.

Top row.—J. O. Logan (Shiftboss), A. Herring (Shiftboss), W. R. [illegible] (Shiftboss), G. Ross (Foreman Drillsharpener), E. Marker (Shiftboss), J. Vigne (Foreman Smith).
Second row.—H. H. Fisher (Assistant Sampler), J. G. McLaren (Assistant Sampler), M. Wall[illegible] (Shiftboss), J. van de Velde (Machine Overseer), [illegible] A. Ramsay (Foreman Timberman), B. Cohen (Junior Clerk).
Third row.—C. F. [illegible] (Sampler), F. G. Stanford (Shiftboss), G. Izett (Foreman Fitter), J. K. Parkinson (Native Timekeeper), T. Ham (Foreman Carpenter), G. English (Foreman Timberman), B. B. Butler (Assistant Native Timekeeper), A. McWhirter (Mill Foreman), T. Canning (Assistant Native Timekeeper).
Fourth row.—R. Iswell (Assistant Surveyor), T. Bernard (Shiftboss), J. H. James (Shiftboss), E. Ellis (Assistant Sampler), O. Pemberton (Acting Timekeeper), J. C. Phillips (Acting Cyanide Overseer), A. S. Ross (Tube Mill Foreman), F. A. Taylor (Shaft Clerk), T. Toland (Acting Cyanide Foreman), J. F. Simpson (Assistant Secretary).
Fifth row.—W. B. V[illegible] (Assistant Engineer), G. H. Islander (Surveyor), A. J. Dent (Secretary), W. Strong (Mine Foreman), A. Tennant (Assistant Manager), F. A. Douglas (Manager), A. Job (Engineer), H. Gate (Mine Foreman), K. B. Lamont (Mill Overseer), W. S. Taft (Consulting Manager), W. Winter (Foreman Electrician), L. Hudson (Office Boy), G. Semple (Time Office Boy).

Olliver, Photo.

"WELFARE WORK" ON THE MAIN REEF—II.

What Rand Companies Are Doing for Employees—Health Benefits and Recreative Facilities —The Mines and Housing Schemes—Heavy Contributions to the Phthisis Fund.

In our last issue we dealt at some length with the general principles of social welfare work on the mines of the Rand, and we then discussed what some of the mines under the control of the Central Mining and Investment Corporation had done in this direction and in regard to the campaign against miners' phthisis, including payments by way of compensation to sufferers and donations to the running expenses of the Phthisis Sanatorium. It should now be of some interest to investigate the question of the "square deal" on the Main Reef series more fully, and to see what other groups have accomplished.

Nearly Two Millions on Welfare Work.

Whilst no exact figures are available, it is probable that there has been expended on the Witwatersrand since the conclusion of the Boer War, between a million and a half and two millions of money on the provision of married quarters, single quarters, recreation halls, billiard rooms, bath rooms, etc., etc. The great majority of this huge sum brings in no direct financial return at all, and the rentals received for houses and quarters are purely nominal and altogether trifling. Of this sum, which does not include contributions to the Phthisis funds, it is probable that the Central Mining companies have expended between a half and three-quarters of a million, the Consolidated Gold Fields a quarter of a million, the Goerz group perhaps £150,000, the Farrar and Anglo-French Companies almost a third of a million, the Neumann Group, say, £150,000, and the Barnato, Albu, Robinson and Consolidated Mines Selection Groups, say nearly another half a million between them. Although many properties are now practically fully equipped in regard to living quarters, recreation halls, etc., the work proceeds as new mines come to be equipped, and in this connection it may be of interest to note the preliminary welfare work achieved up to the end of last year on the Modderfontein Government Areas property under Barnato control.

At the Government Areas.

The Government Gold Mining Areas Company has already achieved important welfare work in regard to the housing and comfort of the employees. Although construction work was commenced only a few months ago, the company built last year six blocks of single quarters, containing four rooms each, eight semi-detached houses for married workers and two detached staff houses. In addition, extensions were made to the north boarding house for recreation room, reading room, and staff mess room, and at the end of the year eight blocks of single quarters, each containing four rooms, were in course of erection. The Modder Government Areas will commence crushing on a basis of 50,000 tons per month. Later on there will be extension, perhaps almost indefinite extension, and it is clear that in the years to come the Modder Government Areas will be employing a very large number indeed of white workmen. Accordingly plans are under consideration for very considerable extension of quarters and the enlargement of recreation halls, etc., for in the case of a mine such as this situated at a considerable distance from town it is even more important that the men should be as comfortable and contented as possible than on a property situated in the heart of the Reef. This has been fully recognised by all those companies which are engaged in developing mining properties on the Further East Rand, and in addition to the concerns under the control of the Central Mining and Investment Corporation which were mentioned last week—the Modder B., for example—the Brakpan Mines, Van Ryn, Kleinfontein, Geduld and Van Ryn Deep are each well equipped with quarters for both single and married employees and also with recreation halls, libraries, billiard rooms, etc. And in addition to the Modder Government Areas, the Modder Deep Levels, which is now proceeding with constructional work, is making arrangements for the comfortable housing of employees and providing for their leisure and recreation "after hours." In short, it can be truthfully said that no controlling house on the Witwatersrand can in any way be accused of neglecting the welfare of employees. In the first place and quite apart from any humane considerations, it would not of course be at all profitable to mines concerned to be neglectful of this important aspect of Rand industry.

Married Men Wanted.

A contented workman is worth to an employer at the very least two discontented workers, probably three or four. If humane motives were insufficient to have prompted this course—and there is no reason to suppose that directors and mine managers are less endowed by nature with these sentiments than are other men—the irresistible laws of industrial economics would have sufficed. There are few employers of labour upon any scale, and probably none who employ men in large numbers, who fail to recognise that importance of healthy minds and healthy bodies which is concisely expressed in one of the oldest of extant Greek apothegms and has been re-discovered, so to say, in the great workshops of to-day. It is unnecessary to consider the question of motives in this connection; the point we wish to make is that upon the lowest grounds of elementary self-protection, and the teachings of ordinary common-sense, it was incumbent upon the mining houses of the Rand to undertake those schemes of general betterment of the miners' living conditions which it is the humour of their critics to speak of as having been forced upon them. Over and over again it has been stated by chairmen of large mining corporations operating on the Witwatersrand that it is the earnest desire of the mines to attract to the Reef a population of happy and contented workers and particularly of married employees. It is a fact that cannot reasonably be debated that the married man with his wife and children on a mine is far less subject to unsettling influences than the bachelor. The family man invariably values his position more highly, is a more contented worker, and generally a more valuable acquisition than the unmarried man. Hence on all the mines particular attention has been devoted to the married quarters, and the provision for steady, sober employees with their families on the Witwatersrand is certainly not equalled elsewhere in the mining world, and is not perhaps excelled anywhere in the whole vast field of industry. The substantial and comfortable characters of most of these married quarters, their delectable gardens and well-chosen water and sanitary systems would no doubt astound many harsh critics of the sociological work of the mines did they really trouble to come and see what has been achieved. But critics of this nature generally prefer to know nothing of the affairs that they condemn.

Phthisis Contributions.

Supplementing the particulars given in our last issue as to contributions to the Phthisis Fund, we hereunder give details under this heading for some of the Albu and Barnato mines in respect of last year:—

General Mining and Finance Corporation.

Aurora West	£2,202	11	9
Cinderella Consolidated .. .	3,152	3	3
New Goch	3,973	12	10
Roodepoort U.M.R.	*8,063	14	11
West Rand Consolidated	6,997	5	11

* Including other compensation.

Johannesburg Consolidated Investment Company

Consolidated Langlaagte	£6,106	14	5
Ginsberg	2,290	3	1
Glencairn	1,964	7	8
Government Areas	692	0	2
New Unified	1,859	0	10
New Primrose	2,883	5	3
New Rietfontein	28	5	10
Witwatersrand	5,357	9	10

PROGRESS OF THE BARNATO GROUP.

Positions of Chief Subsidiaries Discussed—Government Areas to Mill in November—Excellent Results from Consolidated Langlaagte, Knights, and Van Ryn Deep.

The affairs of the mines under the control of the Johannesburg Consolidated Investment Company continue to be in an eminently satisfactory position. The native labour supply has improved materially during the past few months, and although the Ginsberg is still somewhat short of "boys" the mines of the group generally are at the present time in the happy position of having little to complain of in regard to the native labour supply.

INCREASING PROFITS.

Improvement in this direction has very naturally been reflected in profits, which have shown advance for many months past, and which in May touched high water mark at £110,139. It will be interesting to note the progression since the beginning of the year, and for this purpose we give the following statement of monthly gross profits:—January, £87,277; February, £91,055; March, £104,704; April, £101,493; May, £110,139. The tonnage milled in May was 220,701 as compared with 206,735 in April. The Van Ryn Deep headed the list both in regard to output and profit, the figures being £69,535 and £34,601 respectively. For the preceding month the output was £66,260 and the profit £31,96[illegible]. The Consolidated Langlaagte and Witwatersrand also recorded substantial advances. The other subsidiaries [illegible] well maintained the results secured in the preceding month. These figures, satisfactory as they undoubtedly are, will in the near future show further advance. The Government Gold Mining Areas will commence production before the end of this year. The mine is a huge one, and although of low grade nature will assuredly earn considerable profits, provided an adequate supply of native labour is forthcoming. This consideration is indeed the only "if" in the question.

At this property it is particularly noteworthy that there has been a marked improvement in development since the end of the year. The ore reserves at the end of April were 1,241,[illegible]24 stoping tons, valued at 6·35 dwts. Recovery will probably work out at about 28s. per ton. The management is now hastening connection with the two southern shafts; and it is satisfactory to note that the mine can reach the producing stage without financial difficulty. By the time milling operations commence this property should be possessed of ore reserves not far short of two million tons.

ADVANCED STATE OF CONSTRUCTION.

Constructional work has now reached an advanced stage, and amongst the items of plant recently installed may be mentioned the tube mills, tanks of the cyanide plant, extractor house, slime agitator, and numerous buildings. These have either been finished or are now in place. The mortar blocks of the battery were installed some considerable time ago, but there has been some little delay in connection with the erection of the mill house. This has, in fact, been the only little disappointment in regard to constructional work at the Government Areas property, but whilst it has in some small way interfered with the sequence of erection and has delayed the installation of the mortar boxes, no important time will be lost and the whole plant, which, in the first instance, have a capacity of 50,000 tons per month, will be completed well before the end of the year. It is, in fact, not unlikely that a portion of the equipment will be given a trial run towards the end of October next. The date of the official start of milling operations at the Government Areas is at present unknown, but it is at least probable that a goodly portion of the equipment will be at work in November.

VAN RYN DEEP.

The Van Ryn Deep continues to open up in an eminently satisfactory manner. The payable ore reserves at the 31st December, 1913, were estimated to amount to 1,953,845 stoping tons of an average assay value of 8·6 dwts., the tonnage being based on an average stoping width of 55 inches. The consulting engineer estimated that allowing for 15 per cent. of sorting the milling tonnage stood at 1,660,760 tons, of an assay value of slightly over 10 dwts. The recovery value of this ore is probably in the neighbourhood of 35s. The May working profit was at the rate of 16s. 2d. per ton with working costs at 16s. 11d. per ton. The company is now crushing up to practically its full capacity. In May over 42,000 tons were milled. Whilst nothing definite can be said in regard to increasing the plant of this highly profitable mine, it may be pointed out that there is room for another 10 stamps in the mill and that it is not unlikely that in the future another 10 heads and additional tube mill plant will be installed.

CONSOLIDATED LANGLAAGTE.

The Consolidated Langlaagte is also doing very well, and last month this company excelled itself in point of crushing by putting 52,000 tons of ore through the mill. The duty in May was 22½ tons per stamp per diem, and the working profit earned was £25,652, with working costs at 15s. 4d. per ton. In connection with this company and the Van Ryn Deep both of which possess new high duty plants and come under the Sunday milling restrictions, it is important to note that the current month—July—has a maximum of running time, there being only four Sundays in a 31 days month. This means 27 milling days, and accordingly very good results in respect of the current month's operations are to be anticipated for both these mines.

AFFAIRS OF THE WITWATERSRAND.

Another company which is achieving remarkably good results is the Knights, or Witwatersrand. Here working costs ruled at the very low figure of 12s. 10d. per ton during May as against 13s. 8d. in April and 13s. 3d. in March. The May profit of £23,326 compared favourably with £21,431 in April and £22,937 in March. This company has a valuable asset in its deep level claims, which are now opening up very well, and it can be safely assumed that this company has a long and profitable life before it.

Blaauwbosch Diamonds.

The washing returns for June, 1914, were as follows:—Blue ground washed, 8,27 loads; recovered, 1,630 carats, or 19·69 carats per 100 loads.

New Native Labour Regulations.

The amended Regulation *Twenty-two* under Act No. 15 of 1911 now reads as follows:—1. No contract of service shall be attested or registered (*a*) which contains conditions admitting of the reduction of the rate or rates of pay shown on the contract sheet; (*b*) in which the name or names of the runner or runners, if any, by whom the natives attested under such contract were recruited is not disclosed; or (*c*) under which any native labourer is required to work more than three hundred and sixty working days; provided that where a minimum task is required to be completed under the contract no day shall be counted as a working day on which such minimum task has not been performed. 2. Every contract of service entered into by a labour agent on behalf of any employer with a native recruited by him may be cancelled by the director, a magistrate, or inspector appointed under section *eighteen* (18) of the Act where the native who is engaged for service (*a*) is apparently under the age of eighteen years; or (*b*) is liable to be declared a prohibited immigrant by reason of the fact that he is domiciled in an area to the north of the twenty-second parallel of south latitude. Any native referred to in this sub-section whose contract has been cancelled may be sent back to his home, or may, with the sanction of the director, be permitted to engage himself for other employment.

THE PATTERN TIN DRESSING PLANT OF THE TRANSVAAL.

Modern Equipment to Treat Leeuwpoort's Low Grade Ores—Some Novel and Successful Features.

THE ore-dressing plant recently erected at the Leeuwpoort mine is undoubtedly the last word in tin mining equipments in this country—probably in the whole tin mining world. It is a pity that its completion was accompanied by the present serious drop in the price of tin, but that does not obscure the fact that the reduction and concentration plant at Leeuwpoort embraces every modern improvement, and includes some that are new. A tin-dressing plant is necessarily complicated, more especially when designed to treat entirely dissimilar ores from the numerous occurrences or mines on the Leeuwpoort property. Some of the ore is fine grained, some coarse, and some contains a large proportion of either iron-oxide or sulphide. In view of these facts, the results obtained, as reflected in the report issued a few weeks ago, and fully explained by Mr. Julius Jeppe at the annual meeting, cannot but be regarded as highly gratifying to all concerned.

REDUCTION AND CONCENTRATION PLANT.

The mill and concentration plant occupy an ideal site on the slopes of a hill, about midway between the main workings. Provision has been made for extension at any time, and the whole lay-out bears evidence of most painstaking study and forethought. The sorting and crushing station has a belt conveyor system, with Lea's washing trommel for fines and coarse, including picking belt feeding direct to mill bin conveyor. The reduction and concentrating plant (supplied by Messrs. Fraser & Chalmers, Ltd.) consists essentially of 15 Californian stamps (1,250 lbs. falling weight) and 2 Nissen stamps (1,500 lbs. falling weight), having a common King Post with 5 head of the Californian stamps. The concentrating plant includes Hartz jigs, R. J. classifiers, Buss and Wilfley tables, Isbell Frue vanners, Dorr thickener, rag frames, round frames, together with tube mill, Huntington mill, and Brunton calciner. An automatic slimes sampler has been installed for taking hourly samples of slimes tails. An Elmore pulp sampler has been erected for sampling battery pulp.

NOVEL FEATURES.

The two Nissen stamps, the Dorr thickener, R. J. classifiers, and Buss tables, which are new features in a tin plant in this country, have fully justified their inclusion, and are doing good work. Owing to the comparative fineness of the disseminated cassiterite, and lack of "free" tin—fine crushing (400-300 mesh) has had to be resorted to—which naturally increases sliming and consequently the subsequent concentration difficulties. The plant as a whole has run well and given satisfactory results for the initial stage, when it is remembered that the property is a new one, the lodes consisting of greatly divergent complex ores, which are obtained from several very dissimilar workings or mines. As the ore becomes more pyritic with increasing depth, additional roasting and regrinding plant, together with the necessary concentrating units, will be required. Owing to the fairly complete and efficient classification, no additional slimes plant will be required, notwithstanding the fact that fine crushing is necessary. There is hardly sufficient poor slime feed at present for 21 rag frames. Given favourable development results throughout the present year, which there are reasonable grounds to expect, the manager, Mr. J. I. Jameson, in his last annual report, says the present stamping capacity could with advantage be augmented in the near future by, say, four light Nissen stamps. The special features in connection with the tin dressing plant are:—(1) The provision of efficient and very complete classification in series before concentration (in the form of Richards-Janney classifiers) for both Wilfley and Buss, and also frue vanner feeds; (2) adequate primary treatment of fines, slimes, after classification, on Isbell frue vanners (10 in number), with rag frames, round frames, and Acme tables as secondary concentration only; (3) the installation of a notably short tube mill, employed for regrinding the bulk of the middlings, with a secondary regrinder (Huntingdon mill) for separate higher grade middling products, to bring sliming and consequent losses to a minimum; (4) installation of a Dorr thickener as a more efficient and economical dewaterer than a number of separate small units scattered about the mill; (5) the installation of two Nissen stamps in connection with the Californian stamps (both of comparatively light weight).

The novel Elmore sampler is designed for the automatic and accurate sampling of mill pulp, etc., as the result of much work and repeated trials of different forms of apparatus and practical experience in many ore treatment mills. The good points claimed for this sampler are mechanical design, extreme simplicity, substantial construction, freedom from wear and tear, suitability for duty required, and accuracy in the taking of the samples. The machine occupies very little space, the loss of head being only a few inches, and the sample drawn is mathematically accurate. These machines have been supplied to mines in Africa, Australia, Austria, Canada, England and Wales, Germany, Norway, Spain, Switzerland, and the United States. By a slight alteration in the form of the sampling cup these machines are made quite suitable for sampling dry ore. Undoubtedly the whole plant is more elaborate than that of any other Transvaal tin property, but the ore, it must be remembered, is of lower grade, and more difficult to treat than that of the others. Indeed, the whole concentration scheme is a striking illustration of the successful application of intensive methods to the treatment of a low grade tin ore.

THE POWER PLANT.

The power plant consists of two four-cylinder (direct coupled to alternator), variable admission, Premier gas engines of 212 b.h.p. each, together with two suction gas producers, scrubbers and dryers for charcoal fuel. Two direct coupled alternators, 550 volts three-phase, run in parallel with half or full load. During the month of December, when approximately 50 per cent. of full load for both engines was maintained, the fuel consumption was 1·518 lbs. per b.h.p. hour at a cost of 0.531 pence per b.h.p. hour. These figures have subsequently been further improved.

OTHER ENGINEERING FEATURES.

In addition to the power plant, reduction, and concentrating machinery, the engineering features comprise the following:—An electrically-driven, endless, double-track haulage has been laid from the collecting hopper near the mill to the spruit workings ore bin. In connection with this main haulage system, the shafts at the West, H.G., S. Spruit Extension, and New Strike Workings have been coupled up by a single track. A self-acting gravity plane has been installed from the S. Spruit Extension to the quarry. As an indication of the magnitude of, and distances on, the property, it may be mentioned that the total length of continuous single track laid on surface, at present, amounts to over 10,000 feet—or, say, two miles. Moreover, two main workings at the extreme north and south points—the Nek and C.N. South—have not yet been connected up with the system. It only remains to add that Mr. Seymour Ward was the construction engineer, Mr. S. Thomson the consulting engineer, now succeeded by Mr. D. Wilkinson, and that Mr. J. Irvine Jameson has been the manager from the initiation of operations on the property.

TRANSVAAL MINING AND THE PANAMA-PACIFIC EXPOSITION.

Remarkable Pamphlet in Preparation—The Industry to be Mirrored in Golden Fact and Figure—What the Rand will "Show" the Far West—How Mining has Made the United States.

Though the Union will not be officially represented at the coming big exposition at San Francisco, it is understood that the Transvaal mining industry has decided on an exhibit worthy of itself as a fitting tribute and reminder of what the industry owes to the brilliant sons of the States who have served her. A committee of our leading engineers has in preparation a booklet setting forth the achievements of the Rand, her harvest of gold already gathered, and picturing the noble maturity of her present and the promise of her future. Stupendous figures and wonder-compelling facts will enrich the volume and make it after the fashion attempted in our own 21st Anniversary Number, a monument to the greatness of the industry. We gather, from advices from San Francisco, that no department of the Panama-Pacific International Exposition will make a stronger appeal to the visitor from the Transvaal, the greatest gold-producing country in the world, than the Department of Mines and Metallurgy. In the magnificent Palace of Mines and Metallurgy, a mammoth structure occupying an area of 451 by 579 feet, more than 200,000 square feet of floor space will be available for exhibits, and every State and Territory in the American Union, and nearly every foreign nation whose people are extensively engaged in mining, will be represented. It is eminently fitting and proper that San Francisco, the commercial metropolis and financial centre of the Western States of America, should be the scene of the greatest display of minerals and the most complete exemplification of the manifold methods and processes incident to the mining industry that have ever been attempted anywhere in the world. It was the lure of gold, following Marshall's discovery in 1848, that drew to the Pacific Coast the mighty throng of intrepid pioneers whose splendid achievements wrought the ultimate Western civilisation, the climax of which is seen in the construction of the Panama Canal, which has been appropriately referred to as "the greatest liberty ever taken with Nature."

What California has Done for Mining.

The people of California, and particularly the descendants and other direct beneficiaries of the dauntless pioneers who developed the mining industry of the State, welcome with special enthusiasm the opportunity which the Exposition gives them to exhibit to the world in an allegorical way this greatest of all gold-producing States has done for the mining industry, not only of California, but of the world. The so-called Mother Lode of California, embracing the five counties of Amador, El Dorado, Calaveras, Tuolumne and Mariposa, with the four counties of Placer, Nevada, Sierra and Plumas, lying to the north in the order named, constitutes the great gold belt which was the scene of the wonderful discoveries in 1848 and 1849 that turned the tide of civilisation toward the Pacific Coast. This is the country immortalised by Bret Harte. In twenty years the gold it infused into the arteries of the world's sluggish commerce set civilisation a full century ahead. During the sixty-four years from 1849 to the close of 1913, California produced, principally from this area, the stupendous sum of $1,[illegible] in gold, or nearly as much as all the other mining states combined. During all these years the gold output of California averaged nearly twenty-five million dollars per annum, or more than two million dollars a month. The State still maintains the lead in American gold production, the output for 1913 being a little more than twenty million dollars. The ever-increasing army of prospectors and gold miners spread northward and eastward, and ten years later the famous Comstock Lode was uncovered, just over the line in Nevada. The tremendous output of silver and gold from the Comstock mines added to the large contributions of the yellow metal from California, saved the credit of the nation at a time when not only her political integrity but also her financial status was in danger, and made possible the adoption of the Fourteenth Amendment, the most important amendment ever made to the Constitution of the United States.

Mining and Commerce.

But the service rendered by California and Nevada to the nation during that trying period was eclipsed by the world-wide influence of their subsequent achievements in commerce and finance. They poured into the lap of commerce the greatest volume of gold and silver ever produced anywhere in the same length of time. They sent their miners to sit among the princes of finance in the parliament of industrial progress and commercial enterprise. They sent others to the Senate of the nation. Upon others they bestowed the judge's ermine and the bishop's mitre. They raised a host from penury to affluence, and scattered millions in that now obsolete form of charity that let not the left hand know what the right hand was doing. They revolutionised the waning industry of mining, and their great mining camps became training schools for the pre-eminently efficient mining engineers, metallurgists, and practical mine-workers who later developed the vast mineral resources of Australia and South Africa. They laid railroads across the desert and tied the East to the West with hoops of steel. Their telegraph wires are strung from ocean to ocean, and their cables unite the continents and bind us to the Orient. They erected villas along the sun-bathed stretch of coast from Monterey to San Diego. They built marble palaces in San Francisco, in New York, and in Washington, and raised the mortgages from several more ancient but not more magnificent palaces in foreign lands. There is not a first-class hotel or an important banking institution in San Francisco that does not owe its existence directly to the mines of California and Nevada.

Co-operation from the Transvaal.

So much for the romantic side of the mining industry and what its great revival, due to the gold discoveries in California, has contributed to the progress of humanity. Surely, with this wonderful record of achievement, California may confidently expect the co-operation of the Transvaal, her greatest rival in the production of the precious metals, in making this exhibition transcendently more impressive than any that has preceded it. The Transvaal may well be proud of her pre-eminence in the production of gold. Mining is the only wealth producer. While a large crop of grain or fruit, or a large output of lumber, puts money into circulation, yet these products do not create wealth; they disappear as fast as they are produced. Mining is the only industry that really produces wealth. The Department of Mines and Metallurgy of the Panama-Pacific International Exposition deals with the natural mineral resources of the world, their exploration, exploitation, conversion into metal, their manufacture into structural forms and into raw material for various industries. It takes in the metals and the non-metals, including cement, clay, oil, gas, salt, gypsum, nitre, etc., and their products. These natural resources, of course, will be exhibited by the States of the Union through their several state commissions and by the various nations through their accredited commissions and representatives. Charles E. van Barneveld, Chief of the Department of Mines and Metallurgy, has planned an allegorical representation of the mining industry which will show on a small scale all the phases of practical mining, beginning with the ore or other primary material in the ground, and carrying it through all intermediate processes until it emerges as refined metal or raw material, ready for the mint or market.

Some Unique Features.

A unique feature of the mining exhibit will be a complete elucidation of the comparatively new method of saving placer gold by means of dredges. This is essentially a California development having its inception only about fifteen years ago. There are now about 125 dredges in commission on the Pacific Coast, producing about $19,000,000 annually. The chief significance of this new method of saving gold from gravels lies in the fact that it makes available vast areas which cannot be worked profitably by any other method, with the absolute certainty that hundreds of millions of dollars will be added to the wealth of the world which otherwise would be lost. Another feature which will be especially attractive to visitors from foreign countries is that section of the metallurgical exhibit which will exemplify the processes of producing copper from low-grade porphyry ores. By this method, which had its inception in the Western States of America only a decade or so ago, disseminated porphyry ores running as low as three-quarters of 1 per cent. copper are profitably treated by concentration prior to smelting. The most conspicuous success in this new branch of copper mining is that attained by the Utah Copper Company at Bingham, Utah, where ore running less than 1·5 per cent. copper and about 20 cents a ton in gold is now being mined, concentrated and smelted at the rate of 20,000 tons a day and at a profit close to $1,000,000 a month. This wonderfully profitable method of mining copper ores which until the development of the concentrating process were practically worthless, and which has revolutionised the copper mining industry, is entirely an American invention. Certainly, visitors from South Africa will gain much from a careful study of the methods and processes shown at the mining exhibit in the Palace of Mines at the Panama-Pacific International Exposition, and we have reason to believe that they will not be ashamed of the part played in it by the South African mining industry.

The secretary of the Harmony Proprietary Company has just issued a circular to the shareholders, from which we quote, without comment, the following:—"You will be pleased to hear that the new company, the Harmony Estate (Transvaal) Development Company, Ltd., has been duly incorporated, and allotment letters have been posted. As you are aware, the new company is formed to deal with the mining interests of this (the Harmony Proprietary) Company, which, owing to the richness of the mineral deposits and the magnitude of the area—320 square miles—should before long produce a very big income approaching £100,000 a year, 50 per cent. of which will accrue to this company by means of the deferred shares—as fully explained in the prospectus recently issued—and later on, as the estate is further developed, should be considerably increased. A first subsidiary gold mining company is, we understand, about to be floated by the concessionaires, and the flotation of other subsidiary companies will no doubt follow before the close of this year. The gold reefs and copper deposits existing on the company's area are admittedly very valuable. From information received from a prospector who has spent five years working in the district, it is probable that other valuable minerals of which the directors had no knowledge will be found on the company's estate. Ranching, Agriculture, and Timber.—At an early date the directors will turn their attention to the development of the surface rights of the estate for ranching, agriculture, plantations and timber. The ranching prospects are very great, the grazing land on the estate being considered some of the finest in the Union of South Africa. Messrs. Liebeg & Co. have already successfully started ranching in Rhodesia some distance to the north of our estate, and a big ranching venture is, we learn from last week's *African World*, about to be started by the "Blue Funnel Line" of Liverpool, in the Waterberg district, the adjacent locality to where our estates are situated. Several other ranching schemes are also being inaugurated in South Africa, which shows that locally the importance of such enterprises are fully appreciated. Owing to the scarcity of beef, it is considered that, unless other large ranching areas are opened up, meat will soon become a luxury. South Africa appears to be the only country available."

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THE OUTLOOK FOR TIN PRICES.

No Immediate Prospect of Improvement—Curtailing Operations at Transvaal Tin Mines—Biggest Straits Mine Working at a Loss—Costs in Cornwall and South Africa.

A REPRESENTATIVE of this paper paid a short visit to the Transvaal tin fields during last week-end, and found that the price of the metal was there the all-prevailing topic of the hour. At several of the mines operations are being curtailed, and production limited to the needs of current expenditure and the progress of development work. In the circumstances the course has much to commend it. Opinion is, however, divided as to the merits of a general adoption of the idea as put forward in our columns last week. Much depends on the immediate future of prices. Unfortunately, the position in this respect does not show much prospect of improving in the immediate future according to present advices. Messrs. Rudolf Wolff Krenger and Company, in a circular issued the other day, gave the result of inquiries they have made of their correspondents in the Middle and Far East, and the net outcome may be stated to be that existing conditions will persist till they cure themselves. In other words, production is likely to go on increasing till a reduction is brought about by the shutting out of those producers which cannot work at a profit with tin in the neighbourhood of, say, £135. Commenting on the opinions gathered from their correspondents, Messrs. Krenger and Company remark:—

> Now, what is to be the course of the Tin market? Consumption as before is as large, or larger, than ever, but even so it will not be equal to the supplies that are going to come forward in the near future. These supplies, it appears, will fall off later on. Were the market left to itself we should probably see still further drooping prices, but the Tin market is never left to itself. How soon, therefore, will interested parties begin to buy and discount the better position to be expected later? It seems to us, therefore, that the question of the date of the coming improvement in tin values once more depends, as it so often has done in the past, upon the decision to be arrived at in the minds of manipulators. Left to itself, the market would no doubt have to go even lower temporarily, in spite of the heavy fall of some £[illegible] that we have already had.

The bears have certainly had a good innings of late, and when the big speculators are going to turn round and run [illegible] is now a very pertinent question. To this fall in the market value of the metal is allied the interesting and important question of the cost of production on the various tinfields. The prices quoted in our columns are, of course, for metallic tin, but the producing companies sell what is commonly termed black tin, or tin oxide, which has no standard value. The price obtainable for black tin depends upon the degree of freedom from impurities, and consequently the output of the alluvial mining fields is generally of better grade than the product from lode mines. As a rough average for calculation purposes, black tin is usually reckoned as being equal to 70 per cent. metallic tin. The average obtained for the Cornish product, as a matter of fact, is probably nearer 65 per cent., but, on the other hand, that of a number of the producers from alluvial deposits is rather more than 70 per cent. On the 70 per cent. basis the present price of £140 per ton quoted for metallic tin is equivalent to £98 per ton for black tin, and it is recognised that many of the producing companies must now be working at a loss.

With the object of checking the accuracy or otherwise of this assumption, we have investigated the reports of several of the best known tin mining companies. The largest of the Straits tin producers is the Tronoh, and this undertaking's expenditure last year (including the depreciation allowance and £60,000 paid for ore purchased) totalled £221,300, while 2,187 tons of tin oxide were sold. The cost, therefore, was £101 per ton of tin oxide sold. If allowance be made for sundry receipts, amounting to £13,118, the net cost works out at just over £95 per ton. The Tekka, another Straits producer, expended £19,700 last year and sold 358 tons, so that in this case the cost was just over £55 per ton. Dolcoath, the chief of the Cornish producers, expended (including depreciation) £75,600 in the second half of 1913 and sold slightly over 738 tons of black tin. Thus the cost was £102 per ton, of which lords' royalty represented approximately £7 per ton. The "all in" costs of the Cornwall Tailings Company, of course, are considerably less than those of the Dolcoath mine, having been reduced now to about £60 per ton of black tin; this concern, therefore, is still making a fairly good profit. So far as Nigeria is concerned, the most complete official figures we can recall are those of the Bisichi, which has given its "all in" cost for 1913 as £87 per ton, while at the meeting last month the Chairman foreshadowed a reduction to about £80 per ton this year.

TIN COSTS IN THE EAST.

The cost of production of those companies dredging for tin in the East and elsewhere is of interest in this connection, as dredging is one of the cheapest methods of production. These companies measure their costs of production by the number of cubic yards treated, as obviously it costs no more to produce a pound of tin from a cubic yard than half a pound. Very few dredging companies publish their costs with the monthly returns, but the Malayan Tin Dredging Company is an exception. Analysing the return published recently, we get the following:—Treating 100,500 yards, obtained 31 tons of tin ore, value £2,500, costs £1,500. The net price obtained for the ore was roughly £81 per ton (approximately 60 per cent. of metallic tin), all charges and duty being deducted. On the same basis, if metallic tin was quoted as low as £85 per ton, and 60 per cent. was obtained for the tin oxide, equal to £51 per ton, the value of the 31 tons would have been £1,581, leaving a profit of £81. The costs are roughly 3½d. per yard and the profit 2½d. per yard, even at the present low price of tin. Next week the question of costs on Transvaal tin mines will be considered.

Miners' Phthisis Compensation Applications.

A notice in this week's *Union Gazette* says:—Miners who are entitled to claim compensation under the Miners' Phthisis Act, or any amendment thereof, are notified that their applications (on Form "A") for such compensation should show details of their underground service, and should be accompanied by—(a) all old discharge tickets; (b) their private doctor's certificate of health on the form attached to the application form "A." Blasting certificates and original records of service should not be forwarded with the application. The Board will notify applicants when they are required to undergo the examination of the Board's medical advisers, and immediately that examination takes place, blasting certificates and original records of service should be sent to the offices of the Miners' Phthisis Board, when the applicants will be advised of the day on which they are to appear before the Board. By adopting this procedure miners will obviate any necessity for their being out of work any length of time before their cases are heard.

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THE YEAR WITH THE T. G. M. ESTATES.

Points from the Annual Reports—A Net Profit of £285,468—Profit Record Beaten—Development Curtailed but Ore Reserve Position Improved—Encouraging Outlook.

THE net profit of the T.G.M. Estates for the year ended March 31 last amounted to £285,468 18s. 3d. To this must be added the unappropriated balance at 31st March, 1913, £82,671 2s. 6d., less £59 11s. 0d., since paid out in respect of old dividends, £186 16s. 11d., representing the difference between the nominal value of debentures purchased during the year and their purchase price, £40 7s. 11d., written back under Article 130 for unclaimed dividends and £700 4s. 5d., funds transferred, making a total of £369,007 19s. 0d. This total has been dealt with as follows:—Government tax on profits, £26,340; dividends Nos. 15 and 16, £226,584; debenture redemption—nominal value, £14,144; balance unappropriated carried forward and represented by cash and cash assets less liabilities, £101,938. Under the terms of the Debenture Trust Deed purchases of the company's debentures have been effected during the year to an amount of £14,144, at an average price of £98 13s. 7d., making the total purchases to date, £32,580. The amount required to be redeemed by the 1st April, 1914, viz., £30,000, was thus exceeded and no drawing was necessary. The surplus of £2,580 will go towards the further £15,000 required to be redeemed on the 1st April, 1915. The debentures purchased have been duly cancelled.

GENERAL MANAGER'S REPORT.

The general manager, Mr. S. Aimetti, writes, *inter alia*:—

Owing to the great shortage in the native labour supply which was experienced, especially during the latter and greater portion of the year, and in order to reduce as much as possible the danger of scattering the natives over outside prospecting works, prospecting operations on the outside farms were reduced to a minimum. No work was done on Klipkraal No. 460. A small gang was kept at work on Hermansberg No. 1035 in the hope of locating Glynn's Reef, which is worked at Vaalhoek, but without success. During the year 138 feet were sunk, which, added to the amount previously done, makes the large total of 3,967 feet driven, risen and sunk at the end of the financial year, besides a great deal of cutting and trenching. On Oliphantsgeraamte No. 459 929 feet were driven, making a grand total of 4,619 feet driven, risen and sunk at the end of the financial year. Work was suspended at the beginning of November. On the farm Finsbury 4,236 feet of cutting and trenching were done along the supposed horizons of the Davidson and Button reefs. Work was suspended in May, 1913. The right of prospecting Finsbury No. 621 and Kliprots No. 614 is now leased under a prospecting agreement. From the returns rendered by the prospector, it appears that he is working with a small party, but the results obtained are unsatisfactory so far. Work was started in the beginning of November on Hendriksdal No. 216 by a prospecting party on the horizon of the Theta Reef, but so far nothing of importance has been discovered, although some of the exposures give ample justification for the continuance of operations. Some work was also carried on about 110 feet below the Theta horizon, where an interbedded reef has been opened up underlying an intrusive diorite sheet. Although the values are so far disappointing work is being continued. Altogether 1,528 feet were driven, 138 feet risen and 84 feet sunk, making a total of 1,750 feet. Some little work was done on Belvedere No. 1334 by a prospector on a leader discovered by him on this farm. This prospector intends to make a trial crushing, in a neighbouring small mill, with the ore obtained in the course of his work. The two adits on Ponieskrantz No. 1301, referred to in my last year's report as having been put in from the Pilgrims Creek, for the purpose of locating the dislocated portion of reef between the Theta Mine and the Blyde River, were continued with fairly satisfactory results. An amount of 3,912 tons, valued at 10·93 dwts. per ton, developed from this source was included in the ore reserves as belonging to prospecting operations within the Central Mines area. This prospecting from the Pilgrims Creek will now, from the beginning of the present financial year, be shown under the head of mining. Altogether 1,340 feet were driven, 42 feet risen and 296 feet sunk, which makes a total amount of 1,678 feet accomplished on this work.

DEVELOPING AND MINING.

CENTRAL MINES.—The expectation expressed in my report of last year in regard to the lode extending between the Duke's Hill Mine and the Peach Tree Mine has not been fully realised. Although the Duke's Hill Channel has continued to open up well, the extension of the payable zone has been towards the dip, and the main road, which was being put down westwards in the Peach Tree Mine for the purpose of intersecting the channel, was continued in unpayable ground throughout the year. Although the distance from the face of this road to the payable faces in the channel is only about 500 feet, and connection should be made between them during the present year, nothing can be said as to the value of the intervening ground.

DUKE'S HILL SOUTH MINE.—The way in which this has opened up has been very gratifying. Although the Duke's Hill Channel has taken a turn towards the dip instead of extending in a direct line towards the Peach Tree Mine, as previously anticipated, its extension has opened up a large area of very valuable ground. It is principally owing to this mine that the high rate of profits has been maintained, in spite of the reduced tonnage resulting from the scarcity of native labour, and notwithstanding the drain, the ore reserves here have continued to increase. This mine has not only replaced the old Clewer, as mentioned in my last yearly report, but it has provided the excellent grade of ore to improve and maintain the high rate of profits of the last two years. The first connection between this and the Peach Tree was made during the year, thus greatly improving working conditions, especially in regard to ventilation.

PEACH TREE MINE.—The greatest part of the development which it was possible to carry out was done towards the dip, for the purpose of connecting with Duke's Hill. Unfortunately the section of ground gone through has proved to be unpayable so far. The Columbia Hill section of this mine has continued to expose good values.

THETA MINE.—Most of the work here has been done on the bottom reef, and the values have not been as high as usual. Mining operations were concentrated in the south and east portions, which are to a great extent developed, and it will now be possible to open up more systematically the top reef, the largest portion of which most probably is still untouched.

GRASKOP MINE.—Some important work was done in the way of adits necessary for the further exploitation of that portion of the hill which still remains untouched. It is well to bear in mind that both at the Theta and Graskop, the ground being very soft and irregular, the cost of timbering is very great, and development work can only be done gradually and little in advance of stoping. No work was done in the Columbia Hill shales.

BROWN'S HILL.—The section of this mine which has been opened up through the Pilgrims Creek has fully justified the remarks in my report for last year, and one of the drives at least is opening up the Theta Reef of good thickness and value. Much more work will have to be done here before an opinion can be given as to the extent and importance of this section.

ELANDSDRIFT MINE.—During the year development operations have to a certain degree ascertained the extension of the quartz blow and its value. A tonnage of 15,220, valued conservatively at 18 dwts. per ton, is estimated to be obtainable from this blow in its immediate extension, while it has been possible to ascertain that the further extension of the blow will yield a very considerable amount, about 112,000 tons of low grade but still payable ore. The development of the dip section has been handicapped by water troubles, but, notwithstanding this, 23,050 tons of an average value of 14·7 dwts. per ton are now fully developed. The position of this mine has therefore greatly improved, as we can now reckon on a total of 38,270 tons of an average value of 16 dwts. per ton fully developed, or about five years' working on this tonnage alone. In view chiefly of the very large amount of low grade ore which will be available in the extension of the blow, an enlargement of the present plant should now be considered.

VAALHOEK MINE.—The improvement at this mine recorded in last year's report has continued throughout the year, so that the position is now very satisfactory. The ore reserves have increased considerably. In the Hill section some tonnage, not included in the ore reserves, proved payable, and became available in the course of mining. This section is, however, practically all developed, and only a small portion remains to be mined. The Nek section has yielded as usual fair tonnages from leaders, which were not included in the reserves. The River section has opened up remarkably well, especially on the west side of the Vaalhoek dyke. Some trouble was experienced during the year owing to flooding, which, to a very large extent, retarded the progress of the work. As the prospects of this mine have greatly improved the cost of erection of a small tube mill, and consequent alterations to the plant should be amply justified.

ORE RESERVES.

It is very gratifying to be able to place on record that, notwithstanding the shortage of native labour and the consequent curtailment of development operations, the position of the ore reserves at the Central Mines has been fully maintained. While the tonnage is about the same as last year, the value has slightly increased. At 31st March 1914, the ore reserves stood at 389,233 tons, valued at 14·41 dwts. per ton, or an increase of 3,686 tons and ·18 dwt. per ton over the previous year. Within the Central Mines area there is, in addition to the above, an amount of 9,241 tons, valued at 11·47 dwts. per ton. As already mentioned, the position of the reserves at Elandsdrift Mine has considerably improved. At 31st March, 1914, they were calculated at 38,270 tons, valued at 16 dwts. per ton. As already referred to, the ore reserves at Vaalhoek Mine have materially increased, and at 31st March, 1914, they were estimated at 51,651 tons, valued at 11·41 dwts. per ton. The 2,070 tons on dump, valued at 10 dwts. per ton, mentioned in last year's report, are still intact, thus making a total of 56,721 tons, of the average value of 11·36 dwts. per ton.

GENERAL REMARKS

The profit on working for the year was £291,235 2s. 1d., or £13,284 1s. 7d. more than last year. The Witwatersrand strikes did not directly affect the company's operations, which were carried on as usual. No special mention is necessary in regard to the Belvedere power station, which has continued to justify my gratifying remarks of last year. The rainfall during the year has been good, and an ample supply of water has been available in the Blyde River. The destruction by fire of the main generating station at Brown's Hill on the 17th November, 1913, has not interfered in any way with the running of the plant. The railway from Nelspruit was opened during the year as far as Sabie, and it is now practically completed to Graskop, its terminus. From about the beginning of June it will be possible to obtain supplies from this station, which is only nine miles from Pilgrims Rest. The new water supply and electric light installations, which the company has erected at its own cost for the benefit of the inhabitants of Pilgrims Rest, were completed, and excellent and ample supplies of water and electric light for domestic purposes are now available at very reasonable rates. All the business in connection with the company's estates, natives, timber and transport, has continued satisfactory under the supervision of Mr. Gardner. At Elandsdrift development work in the dip section has been somewhat handicapped by water troubles; however, as Mr. Patrick fully realises the importance of this work, better progress is looked forward to in the future. Mr. H. A. Tute was appointed manager at Vaalhoek in May, 1913, and with the improved development of the river section, this mine has been brought to a satisfactory position. Mr. Carter has continued in the management of the Central Mines, and for the last six months of the year under review, during my absence on leave, he acted in my place, while Mr. Kelly assisted him as underground manager at the Central Mines. In conclusion, it is a pleasure for me to bear testimony to the good work done by the managers and the staff. Notwithstanding the strenuous and troublous year, and the very severe shortage of native labour, which necessitated a great curtailment of development operations, the position of the ore reserves is slightly improved, and the profits are greater than the record made the previous year. It is therefore very gratifying to be able to state that the outlook for the current year is encouraging.

SOUTH AFRICAN ASSOCIATION OF ANALYTICAL CHEMISTS.

Points from Annual Report—Prospectors' Samples and the Government—Mine Air Samples.

THE report of the Council for the year ended 30th June, 1914, has the following *inter alia* —Your Council has much pleasure in submitting its report on the work of the past year, together with a statement of accounts and balance sheet for the twelve months ending 31st May, 1914. The Council regrets to report that only two members and three associates were elected during the year under review, but it is probably owing to the industrial unrest that so few applications were received. It is, however, satisfactory to state that in the near future several chemists have signified their intention of applying for membership, and the Council hopes that the members will second their endeavours in the direction of increasing the membership. The extraordinary meeting of Council was called to consider the question of communicating with the Government Mining Engineer in connection with a notice in the Press inviting tenders for the analysis and assay of prospectors' samples, and arising out of this the use of the title Government contractor. As the local analysts, who were members of the Association had agreed to submit a joint tender and to use no title if successful in securing the contract, it was decided to delay official action pending the acceptance of a tender. The Council communicated in September with the Minister of Mines, giving expression to its views to the effect that it considered the scale of fees of the accepted tender to be quite inadequate and that the present system throws the burden of public philanthropy on the analyst by expecting him to perform unpayable work in the public interest. The Council further suggested that a more equitable arrangement would be for the Government to adopt some such scheme as the payment of half the fee charged by a responsible analyst, the other half being paid by the prospector. The Council also deprecated the practice of calling for tenders for the performance of professional services through the medium of the public Press. The Under Secretary for Mines and Industries replied, and stated that as the contract entered into did not expire until August, 1914, the Council's proposals could not receive consideration at present, but that the Department was prepared to consider them at the expiration of the contract. The matter will require to receive the early attention of your new Council. The by-laws referred to the Council at the first annual general meeting were duly passed and printed in the proceedings. The Minister of the Interior was approached in connection with absolving analysts from serving as jurors but with no satisfactory results; instead, canvassers for the jury list received special instructions regarding the inclusion of analysts. The attention of the Government Mining Engineer was drawn to the advertisement of the contractor for the assaying of prospectors' samples in the *South African Mining Journal*, which had not been altered to the approved title. This was changed to the approved title, but the words "by appointment" were still retained, and, notwithstanding the Council's repeated representations, no change has yet been made. The Council pointed out that the words might convey to the lay mind an impression of some superior ability, whereas the work was given to the lowest tenderer. Consideration was given to the publication of a quarterly journal, but after considerable discussion it was decided that funds would not permit of such an undertaking at present. A further communication was received from a Rhodesian chemist with regard to extending the scope of the Association to Southern Rhodesia, but the Council did not feel warranted at this juncture in reconsidering its previous decision. Towards the end of July last year, the Council approached the Government with regard to the addition of analytical and metallurgical chemists to the list of approved professions in courts of law, on which list the profession did not appear, and, after considerable correspondence resulting in a definite refusal, the Council approached Mr. Patrick Duncan, C.M.G., with a request that he should raise the matter in Parliament. Owing to the unsatisfactory nature of the reply, Mr. Duncan promised to again raise the matter under the Estimates, and the Council drafted a statement outlining their reasons for the request, which was duly sent to Mr. Duncan. The thanks of the Association are due to Mr. Duncan for his efforts on its behalf. A sub-committee was appointed to consider a proposal to extend the Association by the formation of a new class of membership, and the result of its deliberations having already been circulated among the members, will be considered by you at the special general meeting to be held at the conclusion of this annual general meeting, the sub-committee's report having been adopted by the Council. The Council feels that the Association will be considerably strengthened by the alteration proposed. The attention of the Government Mining Engineer was drawn to Regulation No. 59, Chap. VI., Part 1, Mines and Works, having reference to the analysis and sampling of mine air, and it was pointed out that the regulation is not sufficiently exacting to ensure that reliable results are obtained which will properly reflect the ventilation conditions. It seems possible that there might be entered up in the sample-book only such results as are favourable, whilst unfavourable results might be entirely suppressed. As the regulation stands at present, it is even possible to enter up numbers which are not the result of chemical experiment. The Council suggested that the regulation should require that the results entered up in the sample-book be certified by the analyst who made the examination, and that a certificate be entered periodically, proving that all analytical results of air examinations have been duly entered in the book. The Government Mining Engineer, in reply, stated that it was not proposed to issue any amendments of the regulations at an early date. The suggestion made by the Council was a useful one and would be taken into consideration when any further amendments to the regulations are next under contemplation. The thanks of the Association are due to the Press, which has always given prominence to the affairs of the Association; to the authorities of the South African School of Mines and Technology for permission to hold Council meetings in their buildings; to your hon. treasurer, Mr. A. Whitby; to your honorary auditor, Mr. George Mackenzie, for auditing the books and accounts of the Association; to your honorary solicitors, Messrs. Hershensohn & Cilliers, who have been called upon to supply legal advice and assistance to the Council and have done so ungrudgingly; and finally to your honorary secretary, Mr. Jas. Gray, F.I.C.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Shall the Tin Mines Close Down?

SHAREHOLDER'S PLEA FOR A CENTRAL COMMITTEE.

To the Editor, *South African Mining Journal*.

Sir,—I have read with great interest and approval your article on the outlook for the mines in your last issue, and enclose for the benefit of your numerous readers interested in the matter an article on similar lines from *The Cornubian* of June 11, to hand this week. The article is as follows:—

> The position of Cornish mining, brought about by the diminishing price for tin, is giving rise to serious apprehension. It is not only in Cornwall, however, but in other tin mining districts of the world as well, that mines are losing money. A great many properties are working at a heavy loss, and are, in fact, going headlong to disaster. Yet tin is wanted, for it can hardly be said that there is over-production, although the floating stocks are heavy for the time being. The accident of the position is being taken advantage of by market manipulators, who reck nothing of the injury they cause to industry, or of the thousands thrown out of work, so long as they can gamble money into their pockets. With the laws of supply and demand in natural operation nobody can quarrel in a state of society not Socialistic, but the whole working community execrates the power that enables moneyed speculators to rob their toiling fellowmen of their daily bread. In some other countries the law steps in and does something to mitigate the evil; in England, so accepted as a matter of course is the merciless grinding of the poor in the speculative mill that nobody thinks of asking for laws to prevent suffering in the families of hundreds of miners now out of work in this district through this conscienceless bearing down of prices. It is a great pity that some understanding is not come to between the tin mines of the world, so as to limit the output on occasions like the present. It would, of course, be impracticable for the mines to keep back any part of their mineral; but it ought to be comparatively easy to appoint a central committee from the tin producing areas, and to give it power to direct all mines to cease producing for a week or more, at times when prices have been artificially forced down, or when the accumulated stocks have seriously decreased values. It would be far better to restore the equilibrium by allowing the stocks to be absorbed during a brief holiday in the mines, than to march steadily on under the burden to utter destruction, as tin mines have so often done in the past, and as many are now doing. The damage caused by speculators would be controlled by such a course, the cost during the period would be confined to the narrowest limits, the miners would not greatly object to a brief respite from labour, prices would be regulated by supply and demand, and would be kept at a fair economic level, and the industry would be freed from the nightmare of these periodical low values which have so often wrought ruin of stupendous dimensions. We have men in Cornwall who have great influence in the world's tin areas, and they, if they would, could easily meet and set the ball rolling. Each tin mining district in the world could appoint its representative, and these, meeting in London, could in an hour or two settle the industry on a basis of absolute security from such outside attacks and influences. There is nothing at all impracticable or impossible in this course. Tin is a rare metal, and the tin areas are few. Their interests are chiefly controlled from England, and while it might be found difficult to come to an understanding on any other lines, there should be no trouble whatever in making an arrangement to keep the supply and demand as nearly on a par as possible. The present conditions as to output seem likely to prevail for some years to come; and while, doubtless, a large quantity of the metal coming from a new source would upset the arrangement, there are no signs of such a supply from any quarter as yet. Meanwhile, it is to the interest of all concerned in tin mining to enter into some such an agreement as that suggested above.

Yours, etc.,
"SHAREHOLDER."

The Economics of Citrus Growing.

AN INDUSTRY WITH ENORMOUS POTENTIALITIES.

To the Editor, *South African Mining Journal*.

Sir,—On picking up a copy of your paper dated the 20th inst., I was agreeably surprised to read that you had published an article on the fruit-growing potentialities of South Africa. It was refreshing to see that a journal which is devoted almost exclusively to mining and finance should give some space to an industry, which, in a few years, will be second only to the great mining industry of this country. I, however, quite agree with your statement that until the Government formulates some sound schemes to conserve water that a fruit or maize industry will not generally turn out the sound industrial investments that they should do. Of course, there are many very favourable properties which fortunately have abundance of water and only require a small outlay on the part of the owners to make citrus growing a huge success; but what the country requires is some Government scheme to conserve water in many of the rivers and "spruits," so as to bring under irrigation many thousands of acres of ground fit for citrus, now lying idle or merely occupied by native squatters. It is quite true that many thousands of acres of land, now unimproved, with depth of soil and suitable for citrus culture, may be obtained at anything between £3 and £4 a morgen—not acres, as stated by you. The question is often asked, why it is that land in South Africa possessing all the necessary essentials for a citrus orchard has not been taken up by the mining companies and cut up into plots of 20 to 30 acres and sold to miners on easy terms of payment. It is only a matter of a few years when the people of this country will wake up to the fact that South Africa has, as you rightly express it, "an enormous industry staring it in the face, and only requires capital and energy to develop it." We have it on the authority of not only the Government agricultural experts, but from Government statistics, that from the sale of citrus fruits in Europe some lucky farmers are making as much as 35s. per tree, and again the sceptics ask: Why do not the mining magnates invest some of the surplus capital belonging to the mines and develop this industry, which in a few years will give a larger return on the capital outlay than is to-day obtained from many of the mines? It is difficult to answer this question beyond assuming that those who control the mining industry profess to know nothing of agriculture and on the principle of each man to his own trade they prefer to devote their energies to mining propositions. I note that you quote Mr. R. A. Davis, the Chief Government Horticulturist and also Mr. J. B. Bright, of Rustenburg, as having been responsible for stating that as much as 35s. per tree had been obtained by certain farmers for their oranges and £4 per tree for lemons. Surely if these figures are to be accepted as correct it would be an excellent investment for a number of the phthisis afflicted miners to form themselves into a mutual co-operative society, and under the guidance of Mr. Davis acquire a suitable farm possessing depth of soil and sufficient water to put, say, 100 acres under citrus. Let us assume that such a scheme was put into force and that the miners each guaranteed to pay down monthly from their wages a sufficient sum to pay off by instalments 100 acres, and a further sum to thoroughly clear the ground, plough and plant same with the right sort of citrus, so that when the trees start to produce the miners might erect cottages and enter into possession of a revenue-earning estate. The result, according to your quoted figures of £1 15s. per tree, and planted as you say 100 to the acre, would work out thus: 100 acres carrying 10,000 trees, which after 5 or 6 years should yield 35s. per tree, equals £17,500 The cost of the ground at, say, £1 per morgen, or £8 per acre, would be £800. That is the original outlay. To plough and plant this plot of 100 acres would cost about 15s. per acre, £75; digging holes and planting 10,000 trees, say 3d per hole, £125; and the price paid to-day for budded trees, first quality, fit to plant out, is something like 2s. 6d. per tree, equals £1,500. So that the total capital required to purchase the ground, clean, plough, plant, and trees come to £2,500. The miners, however, we must assume, are not prepared to take immediate possession, so that the services of a manager would have to be engaged to work the estate, say, for six years until the trees arrive at the producing stage. Such a man could be got, possessing the necessary experience, at a salary of £20 per month. He would require, say, about six natives constantly working, and suitable boys can be had for £2 per month. The wages, therefore, of one white man at £20 per month would cost £1,440 for the six years, and six natives at 10s. per month equals £864 for the six years. I take it twice a year the orchard would require to be ploughed, for cultivation is absolutely necessary, and this would cost, say, 15s. per acre or £150 per annum. The rest of the work, such as leading water, is covered by the cost of the labour employed. Certain rondavels would have to be erected for the manager and boys to live in, which could easily be covered by an outlay of £100. So that the total expenditure required in purchase of ground, preparing and planting orchard, etc., up to the producing stage amounts to £4,904, say £5,000, which according to the figures given by you will return approximately £17,500 per annum after about six years. If an industry of this nature were carried out on a larger scale and, say, 300 acres planted with 30,000 trees, the expenditure would be £15,000 and the revenue £52,500. The world's markets are open to the citrus growers of this country, as the fruit ripens during the summer month in Europe and has a ready sale. The cost of boxes and transport being deducted still gives an enormous profit. But we are told again by many farmers, who export their first quality of fruit, that in the early season they have got as much as 20s. per 100 oranges and that trees ten years old frequently produce 800 to 1,500 oranges. Later in the season the price drops in Europe to, say, 6s. to 7s. per 100, but that would return about £2 8s. per tree. Lemons we are told often give a return of £1 per tree. The markets of South Africa are insignificant and are supplied with the inferior fruit, and yet even here one has to pay for fairly good Washington Navels 1s. for 6 oranges, or 16s. 8d. per 100. This industry is well worthy of serious consideration, and in the same manner that ground, fit for lucerne growing, has risen from £2 per morgen to £500 and even more per morgen, so also will land fit for citrus with a good supply of water, rise before many years have passed over this country of contradictions and surprises. It is true that there is not a very large area of ground suitable for either lucerne or citrus growing and although Dr McDonald has told us that dry farming embraces the culture of both, I am personally of opinion that it would be a very bad investment to attempt either unless one was sure of a permanent water supply and suitable soil for each. In this district we have had to contend with severe droughts and the rainfall is much smaller than on the high veld, for instance, and yet the farmers here have produced some excellent oranges, naartjes, lemons, and other classes of citrus. A peculiar fruit which grows to an enormous size weighing as much as 20 lbs. to 30 lbs., known as the "pat lemoen," often fetches as much as 1s. each, whilst the grape fruit realises 6d. each. Many farmers are turning their attention to that part of the country running from Waterval Onder to Nelspruit, where the rainfall is said to be something between 40 to 50 inches per annum. There are large fountains and abundance of water, and it is reported that the soil is adapted to citrus, tobacco, and cotton culture, as well as all cereals. There, ground can be purchased at £1 per morgen, and at Nelspruit many orange trees produce 1,500 per tree per annum. The Government might consider some such scheme as the Hartebeestpoort irrigation scheme, and then test the two districts and by that means help to open up the industry which has potentialities second only to the mining industry.—Yours, etc.,

"ECONOMIST."

Rustenburg, June 30th, 1914.

ANSWERS TO CORRESPONDENTS.

G.N. 91 (Barberton).—Any shares bought in the market participate, of course, in all the assets of the company, including the tin interests.

"Vexel."—In liquidation—nothing for shareholders.

Northern Activity.

Working operations are to be resumed on the Dusseldorp gold mine, in the Leydsdorp area. Mr. Valentine, formerly manager of the Sutherland Reefs, is to control the operations on behalf of a London company. Unusual activity is apparent in the northern copperfields, and rumours are prevalent of more than one company of substance who contemplate conducting operations in these parts.

Messrs. Sandycroft, Limited, have favoured us with their latest list describing the "Cascade" induction motors (Hunt's patents). The "Cascade" motor in its simplest form has neither sliprings nor rubbing contacts, yet has all the good attributes of the "Slipring" motor, with additional virtues of its own. The main feature of the motor is its extreme simplicity and the robustness of its construction—in fact, it combines the simplicity of the "Squirrel Cage" machine with the starting and speed-regulating features of the "Slipring" motor. The prices and weights of motors and accessories, as well as full specifications, are given.

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Rhodesian Section.

LATEST MINING NEWS.

May's Record Output—Accident at the Globe and Phœnix—Health on the Mines.

The mineral output of Southern Rhodesia is steadily increasing. The total value of production for the month of May has been officially declared at £315,700, as compared with £314,044 in April, and constitutes a record month's production for the territory. The figures for the two months read as under:—

APRIL.		MAY.	
Gold	£295,907	Gold	£290,062
Silver	1,146	Silver	1,028
Lead	235	Lead	226
Chrome Iron ...	6,788	Chrome Iron ...	13,475
Coal (Sales)	8,610	Coal (Sales)	10,215
Asbestos	1,170	Asbestos	—
Diamonds	188	Diamonds	691
Total ...	£314,044	Total ...	£315,700

As will be seen from the foregoing tables, the record total was not due to the gold returns, which actually show a decrease for the month of 1,353 ozs. in weight and £5,845 in value, but to the largely increased shipments of chrome ore—£13,475 worth as against £6,915—and to the increased amount of coal sales from the Wankie Colliery—£10,215 as compared with April's £9,336. It will be noticed, too, that there were no shipments of asbestos during the month, although considerable work, with excellent results, is going on at the asbestos quarries at Victoria. The fact is, of course, that the shipments both of asbestos and of chrome iron must vary greatly from month to month by reason of facilities, or otherwise, in the matter of transport available. The output of diamonds from the areas of the S.A. Option Syndicate, at Somabula, is encouraging. But chief interest will centre, as usual, in the gold output, and especially in the returns from the larger among the new producers. At the Shamva, where 56 Nissen stamps and 8 tube mills were in operation, the tonnage dealt with was 46,730, as compared with 39,012 in April, but the gold won was worth only £22,418, as against the recovery of £27,093 in the previous month. It is explained in an official note that over £8,000 worth of gold was absorbed during the month by new sections of plant brought into commission. The working costs, as already notified, are well within the estimates, while the extraction is better than was anticipated. It only remains then, seeing that the full plant has now been brought into operation, that a grade of ore be sent to the mill which more closely approximates to the average grade of the reserves, in order that anticipations as to the total gold recovery may be fully realised. We have no official information on the point as to whether the required alteration in the value of the "feed" is to be made during the current month or not. The figures from the Cam and Motor read: 11,120 tons roasted for a recovery value of £13,958, which show a large decline in both respects when compared with April's figures and which indicate that operations have needed to be substantially reduced pending the additions and alterations to the plant which have already been notified as necessary. The return from the Antelope Mine last month was worth £7,680, an improvement by £1,560 on that for April. At the Bell Mine also there was an encouraging improvement—£4,444, as compared with £2,929.

* * * *

A Que Que correspondent writes to the *Rhodesian Mining Review*.—A serious accident took place at the Globe and Phœnix mine last week. At the 16th level station a gang of boys were waiting to be brought to the surface, when, without the slightest warning, a heavy fall of rock occurred in the station, killing eight of the natives outright and injuring about fifteen more. As luck would have it, all the white men had just previously gone to the surface. The Government Mining Inspector, with the general manager of the mine, together with the mine captain, had been at the station only about an hour before.

* * * *

In the report of the Medical Inspector of Mines of Southern Rhodesia for 1913, it is stated:—*Health and Mortality*.—It is satisfactory to be able to record that the year 1913 shows a lower death-rate among native mine labourers than any previous year. With the exception of the month of January, there was a general all-round improvement in the health and mortality throughout the Territory, and among all classes of labour. The death-rate in January was very high (52·77), and was due to the "carry over" of the large amount of sickness from the end of 1912, the result of the prolonged drought of that year. During the second quarter the sickness death-rate dropped to 14·11, the lowest for any quarter ever recorded in this Territory. Pneumonia, as usual, was the principal cause of mortality, especially amongst tropical natives, but shows a marked improvement on the previous year. The following was the mortality rate for each quarter:—

	Sickness.	*All Causes.*
First Quarter	26·95	33·77
Second Quarter	14·11	18·49
Third Quarter	22·64	25·36
Fourth Quarter	30·22	34·20

The mortality rate for the year 1913 from all causes was 28·20, as compared with 35·83 in 1912, and from disease only 23·49, as compared with 31·11.

* * * *

Thistle-Etna Gold Mines.

At the fifth annual general meeting of the Thistle-Etna Gold Mines, Ltd., held in mail week, at 8, Old Jewry, E.C., Mr. R. G. Fricker presided. The Chairman, in the course of his speech, stated:—

The financial position at date is that we have a balance to our credit of £17,136. Working costs for the past year averaged 22s. 4½d., as compared with 26s. 4d. in 1912, while for the last quarter they came down to 20s. 3½d. This includes the royalty paid to the Chartered Company, which for the past year averaged 1s. 7d. for each ton milled. With regard to the mine itself, at the end of 1912 we had in reserve 11,615 tons of ore of an assay value of 9·8 dwts., to which had to be added 4,430 tons on the dump, valued at 3 dwts. At the close of this year in the Etna, Thistle, and Faith mines there were 10,434 tons of an assay value of 8·1 dwts., and, including 7,000 tons of 5 dwt. ore in the rubble and dump, we have a total of 17,434 tons of 6·8 dwts., against 16,050 tons in December, 1912, valued at 7·9 dwts. Although we have increased our ore reserves by about 1,400 tons, we have crushed during the year just over 37,000 tons. Of this 24,366 tons were mined from the Etna, of which about 4,500 tons had been dumped at the mill at the end of the year in order to carry us through the wet season should there be any difficulty in transport. You will remember last year we had great hopes of the Faith proving a payable small mine, but these hopes have been dissipated because it has been proved by the winzes put down from the first to the second levels, that the reef did not continue more than 25 feet below the first level, and your consulting engineer states that there appears no prospect of its coming in again at depth. On the other hand, we have derived both from the Etna and from the Thistle a larger tonnage of ore than we expected. During the few remaining months that we can continue milling we may hope to add from £1,000 to £1,500 a month profit, especially as there will be little or no more expenditure on account of development.

RHODESIA'S MINERAL OUTPUT.

Another Record in May—Details of Production.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of May, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
BULAWAYO DISTRICT—				
[illegible] 1 (W. J. [illegible])	2	[illegible]	[illegible]	294
Do. (sands)	—	98	27·27	114
[illegible] (Mrs. H. L. Maidwell)	15	253	142·83	600
[illegible] G.M. (Rhod.), Ltd.	2BM4P1T	3.233	900·70	3,783
Do. (sands)	-	150	927·91	3.897
Do. (slimes)	—	2.976		
[illegible] (Est. R. [illegible], decd.)	[illegible]	783	[illegible]7·45	367
Do. (sands)	—	510	14·98	63
[illegible] (Morrison & Granger)	5	258	68·06	286
[illegible] 2 (Ding Dong Syndicate)	2	22	9·62	40
Big [illegible] (W. E. [illegible]), April-May	[illegible]	343	158·63	666
Do. (sands)	—	22[illegible]	43·06	181
[illegible] (Forbes Rhod. Synd., Ltd.)	15	827	137·24	576
[illegible] (J. [illegible])	2	25	46·53	195
[illegible] (E. W. [illegible])	5 1C	600	62·44	262
[illegible] (W. H. Robinson)	2	252	48·65	204
Do. (sands)	—	300	4·62	19
[illegible] and Prestwood (J. Black)	5	857	195·16	620
Do. (sands)	—	370	33·24	140
[illegible] Mines, Ltd.	20 8N 3T	6.400	173·97	731
Do. (sands)	—	3.150	544·73	2.288
Do. (slimes)	—	3.277	250·50	1.052
[illegible] (D. and C. Syndicate)	1[illegible] 1C	1.046	60·48	254
Do. (sands)	—	841	74·95	315
Do. (slimes)	—	205	35·34	148
[illegible] & Nelly Extra (B. L. Whyte)	5 2 Nissen	986	118·11	496
Colleen Bawn (Colleen Bawn Syndicate, Ltd.)	6 2P	715	46·64	196
Do. (sands)	—	515	60·80	255
Do. (slimes)	—	615	67·32	283
Criterion Gold Mines, Ltd.	10	1 611	274·70	1.154
Do. (sands)	—	1 176	64·83	272
[illegible] A (Macdonald & Co.)	1[illegible]	671	96·41	405
Do. (sands)	—	264	22·22	93
[illegible] A (Cooper & [illegible])	5	700	139·63	586
Do. (sands)	—	322	65·53	279
[illegible] (D. W. K. Synd.)	1H	36	12·32	52
[illegible] (H. S. Henderson)	5	621	243·88	1,024
Do. (sands)	—	410	42·34	178
[illegible] (E. E. [illegible])	5	347	173·54	729
Fred (Transvaal & Rhod. Est., Ltd.)	10 2P	1 700	863·94	3,628
Do. (sands)	—	1 7[illegible]	185·93	781
[illegible] B (Barrett & Stacey)	5	[illegible]44	198·45	833
Do. (sands)	—	234	57·52	242
Golden Butterfly (Wheeler, Davis and [illegible])	5 1P	[illegible]	17[illegible]·95	756
Do. (concentrates)	—	3	15·93	67
[illegible] (W. W. Mining and Fin. Corp., Ltd.)	1H	17	5·21	22
[illegible] (J. F. Gordon)	3	36	11·[illegible]	46
[illegible] (Est. B. [illegible], decd.)	5	162	53·76	226
Do. (sands)	—	105	7·75	32
J (J. A. [illegible])	5	321	50·28	211
Jeffs ([illegible] & Strong)	3	128	242·56	1,019
[illegible] (J. P. [illegible])	[illegible]	520	2[illegible]·14	1,0[illegible]
Do. (sands)	—	[illegible]	73·31	[illegible]
[illegible] (Yellow Jacket Synd.)—April and May	5	1 35[illegible]	[illegible]·52	[illegible]26
[illegible] (M[illegible] Syndicate)	[illegible]	130	27·[illegible]	115
Li Hung Chang (E. F. [illegible]) [illegible]	—	—	7·34	31
Little [illegible] (T. A. [illegible])	3	[illegible]	[illegible]1	121
Lone Hand (Armstrong, Forbes & Alexander)	5	[illegible]12	113·7[illegible]	[illegible]7[illegible]
Do. (sands)	—	615	74·2[illegible]	[illegible]12
[illegible] Reef G.M. Co., Ltd.	20 3T	5,42[illegible]	[illegible],233·2[illegible]	5 1[illegible]
Do. (slimes)	—	5,420	2,[illegible]24·17	[illegible]2
[illegible] & Lady [illegible] Mines, Ltd. & [illegible] Co., Ltd.)	13	[illegible]	[illegible]9·26	[illegible]27
Do. (sands)	—	[illegible]	116·[illegible]	[illegible]91
Do. [illegible]		[illegible]	[illegible]	14[illegible]
[illegible]	[illegible]	[illegible]2	[illegible]	44
[illegible]	[illegible]	[illegible]	[illegible]	416
[illegible]	[illegible]	[illegible]	[illegible]2[illegible]	1[illegible]
[illegible] Gold ([illegible] Gold Synd.)	[illegible]	[illegible]	2[illegible]	[illegible]1
[illegible] Co., Ltd.	[illegible]	[illegible]	[illegible]	[illegible]25
Do. (sands)	—	[illegible]	[illegible]	[illegible]471
Do. (slimes)		2[illegible]	[illegible]	1[illegible]5
[illegible] (C. M. [illegible])	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] (C. A. [illegible])	[illegible]	[illegible]	[illegible]	27
Namaqua (T. W. Angus)	2	200	34·70	146
Nelly (F. D. Roscoe)	3 1H	815	576·61	2,422
Do. (sands)	—	390	112·65	473
New Eclipse (J. R. Stewart)	5	871	150·06	630
Do. (sands)	—	300	20·79	87
New Jess 1 (M. & G. Hogg)	2	100	114·06	479
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	1,761	469·31	1,971
Do. (sands)	—	1,089	220·93	928
Paliki (E. Rochford)	2	120	24·60	103
Peach A. (Peach Syndicate)	5	112	307·48	1,291
Planet (Triggs & Huntley)	5	287	59·96	252
Princess (C. A. Abbott)	2	169	59·20	249
Riversdale (Bruhns & Schwarz), sands, February)	—	210	11·35	47
Riverside (R. Martindale)	2	60	36·01	151
Do. (sands)	—	36	9·29	39
Rous 1 (A. G. Hadingham)	2	73	28·70	120
Rubble (J. Gilpin)	6	200	42·10	177
Rubicon (Anglo-Rhod. Dev. Co., Ltd.)	5	258	17·58	74
Sara (E. Cooper)	2	150	62·97	264
Smiley (C. Brunton), sands	—	625	26·52	111
Star (Star of Rhodesia, Ltd.)	5	120	41·18	173
Teutonic (Macdonald & Bonshor)	5	685	545·43	2,291
Tuff Nut (King's Synd.), slimes	—	220	39·99	168
Unviga (Cumings & Berry), sands	—	310	39·22	165
Umvoti (Henderson & Toshack)	2	175	102·31	430
Winifred (Exchange Synd.)	5	408	159·10	669
Do. (sands)	—	200	32·77	138
Bulawayo district total			17,092·37	71,786
GWELO DISTRICT—				
Alderman (Williams & Woodger)	3	170	131·18	551
Ardpatrick (C. Matcham)	3	392	134·58	565
Arizona (L. R. Evans), sands	—	360	39·42	166
Avondale (A. Malcolm)	5	140	17·16	72
Bedad (A. & B. Syndicate)	5	390	80·21	337
Do. (sands)	—	250	8·44	35
Bell Reef Dev. Co., Ltd.	2BM 1T	2,528	1,051·03	4,414
Bonsor (Cornish Syndicate)	20	3,265	293·90	1,234
Do. (sands)	—	1,330	67·72	284
Cactus (Renton & Gray)	5	500	99·40	418
Do. (sands)	—	480	71·66	301
Camelia (S. Levin)	5	945	404·00	1,697
Cinderella (P. Burt)	E	255	28·15	118
Collingwood (Pine & Wearing)	5	320	144·07	605
Csardas (Wolfshall Synd.)	10	664	569·32	2,391
Do. (sands)	—	510	69·73	251
Do. (slimes)	—	154	16·17	68
Eileen (M. L. Price)	5	496	66·08	278
Fenella (J. Kinrade)	5	25	20·54	86
Gaika G.M. Co., Ltd.	5 1C	3,313	1.488·10	6.250
Do. (sands)	—	1,429	192·50	809
Do. (slimes)	—	2,096	163·43	687
Glen Rosa (H. G. MacKintosh)	2	112	73·19	307
Globe & Phoenix G.M. Co., Ltd.	40 10P	6,546	5,388·20	22.630
Do. (sands)	—	4,425	1,096·06	4,604
Do. (slimes)	—	2,277	497·40	2,089
Do. (concentrates)	—	265	477·62	2,006
Gothic & Pagamesa (Mashonaland Agency, Ltd.)	15 2P	1,250	358·60	1,521
Do. (sands)	—	1.540	201·29	833
Do. (slimes)	—	230	48·82	228
Incondomo (F. C. Luxat)	2H	975	221·70	931
Do. (sands)	—	676	56·38	237
Invulnerable (W. H. Steele)	5	83	15·81	66
Little Blossom (J. Hazlehurst)	2	180	123·58	519
Maise Luck (J. Jones)	6	95	23·38	98
Moonie River (Yellow Jacket Synd.), sands	—	200	12·72	53
Moss (James & Morrisby)	2	407	232·73	977
Do. (sands)	—	384	18·02	76
Multum (W. Cock)	3	100	8·08	34
Pompey (Blot & Franks)	2	187	46·22	194
Redhill (Redhill Dev. Synd., Ltd.)	1 C	2,964	81·62	343
Do. (sands)	—	1,646	103·10	433
Shamrock (Crampin & Masters)	10	720	150·12	630
Do. (sands)	—	300	34·39	144
Somerset (D. & J. Laing)	2	120	66·46	279
Spiral (C. C. Stack)	2	12	10·07	42
Tebekwe B. (A. N. Tyrrell)	10	544	157·10	600
Tebekwe 1 (A. N. Tyrrell)	10	791	361·75	1,519
Tebekwe B (H. C. Baker)	5	284	33·04	139
[illegible] (L. Malcham)	5	238	79·71	335
Veracity (J. Fischer), May & April, slimes	—	675	67·53	284
Wanderer (Selukwe) G.M. Ltd.	4GR	12,276	1,547·80	6.501

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Warner (Yellow Jack Synd.)	5	600	62·70	263
Do. (sands)	—	95	5·40	23
Watch (T. Pedlow)	5	90	14·12	59
Welcome Back (F. C. Luxat)	2 1H	870	177·99	748
Do. (sands)	—	556	67·43	283
Yankee Doodle (Bruhns & Schwarz)	10	1,511	276·47	1,161
Do. (sands)	—	1,053	221·59	931
Gwelo district total			17,564·98	73.797
Matabeleland total			34.657·35 ozs.	
Value			£145,583.	

MASHONALAND.

Hartley District—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Acorn Gold Mines, Ltd.	5	505	77·00	324
Do. (sands)	—	260	42·46	178
Agnes (P. S. Triggs)	5	560	171·29	719
Do. (sands)	—	300	18·41	78
Alabama (Alabama Syndicate)	2	318	72·21	303
Baltimore and Virginia	1Pn	430	59·26	249
Blue Rock (Blue Rock Syndicate). April and May	—	390	93·23	392
Do. (sands)	—	120	31·68	133
Brilliant (Mabel's Luck Synd.)	5 1P	1,102	449·12	1,887
Do. (sands)	—	330	121·12	509
Do. (slimes)	—	1,123		
Brompton (R. R. Aitken)	(5)	450	87·37	367
Do. (sands)	—	375	26·85	113
Cam and Motor G.M. Co., Ltd.	Roasting	11,120	3,291·98	13,958
Cash (Est. J. D. Kelleher, decd.). April	(7)	69	28·05	118
Cheshire Cat (Arnold & Windley)	5	525	162·78	684
Do. (sands)	—	312	52·56	221
Do. (slimes)	—	163		
Concession (C. E. Simpson)	5 1C 2P	2.590	537·70	2.258
Do. (sands)	—	1,762	123·19	517
Dalny (Macdonald & Sale)	5	809	40·35	170
Do. (sands)	—	425	104·43	439
Do. (slimes)	—	374		
Dalny 1W. (Macdonald & Sale)	5	500	87·36	367
Do. (sands)	—	300	57·52	242
Dreadnought B. (W. E. Masters)	1C	405	73·86	310
Eiffel Blue (Willoughby's Con. Co., Ltd.)	10	1.345	485·12	2,038
Do. (sands)	—	900	60·93	252
Eileen Alannah Mining Co., Ltd.	10	1,995	1.064·69	4.472
Ella (Luxat & Morrison)	5	104	54·10	227
Do. (sands)	—	120	30·48	128
Enny Ext. (Ellsmoor & Goodyer)	5	550	180·25	757
Do. (sands)	—	480	55·71	234
Giant Mines of Rhodesia, Ltd.	30 2T	10,908	1.661·76	7,049
Glasgow Mines, Ltd.	5	630	108·37	453
Do. (sands)	—	270	43·14	181
Glencairn No. 3 (Glenrosa Mines, Ltd.)	5	700	434·02	1,823
Do. (sands)	—	440	17·00	72
Golden Valley (J. Mack & Co.)	10	1,176	138·23	581
Do. (sands)	—	630	52·63	221
Hepworth No. 1 (L. Heilman)	2	244	75·06	315
Inez (Harrill & Smith)	10	840	91·42	384
Do. (sands)	—	560	29·80	125
Jessie Palmer (Crown Synd.)	2	200	44·27	186
Do. (sands)	—	180	36·19	152
Juno (H. R. Nicholl)	5	235	48·66	204
Do. (sands)	—	142	29·55	124
Do. (slimes)	—	93		
Kanyemba (Kanyemba Synd.)	5	520	437·89	1,839
Do. (sands)	—	160	104·11	437
Mali (McAdams & Purves)	2	45	6·93	29
Do. (sands)	—	200	12·17	51
Midwinter (Midwinter Syndicate)	4	363	60·94	256
Do. (sands)	—	240	18·13	76
Moliere (H. Moser)	5	590	88·99	374
Mudale B. (C. Munro)	(2)	187	147·33	619
Norman (J. Fraser)	2	280	110·81	465
Orcus 17 (St. Kilda Syndicate)	3	37	8·27	35
Owl (A. Rolfe)	10	1.473	902·18	3,789
Do. (sands)	—	1.225	220·40	925
Pickstone Gold Mines, Ltd.	10 1C	3,049	549·51	2,308
Do. (sands)		1,793	290·56	1.220
Do. (slimes)		1,101		
Pioneer (Hartley Pioneer Synd.), April	5	120	28·23	119
Pomposo (J. Knott)	5	320	163·53	687
Revealed (S. Smith)	(5)	35	4·62	20
Rosaline A. (J. F. Meade), April May	5	335	63·13	260
St. John del Rey (V. L. Synd.), sands	—	420	12·45	52
Seigneury (Arnold & Windley)	5	450	149·20	627
Do. (sands)		300	25·01	105
Shepherds (Phœnician (Rhod.) Co., Ltd.)	5 1T	1.108	233·73	982
Do. (sands)		1.108	112·03	471
Sid (Sebakwe & Dist. Mines, Ltd.)	5	55[illegible]	172·21	723
Do. (sands)		57[illegible]	53·25	224
Strange's Cross (C. E. Strange)	1D		1·86	8
Thistle-Etna G.M., Ltd.	1C	3.274	760·26	3,193
Do. (sands)	—	2,608	168·23	707
Do. (slimes)	—	664	54·91	231
Trinity (G. C. Hooper)	3	166	51·70	217
Do. (sands)	—	202	10·72	45
Try Me 2 (R. R. Aitken)	—	400	73·78	310
Village Main (Bruce & Buchanan)	5	140	40·32	169
Warthog (C. Tallon)	5	165	40·89	172
Washington (I. J. Minnaar)	5	460	467·29	1,963
Do. (sands)	—	400	53·63	225
Hartley district total			16,249·59	68.448

Lomagundi District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alluvial (E. A. Warry)	—	—	12·51	52
Eldorado Banket G.M. Co., Ltd.	15 1C 4P	4,954	1,492·61	6.269
Do. (sands)	—	4,359	755·63	3,181
Gondia (J. A. Morris)	5	170	14·54	61
Linnet (A. R. Morkel)	2Nissen	739	55·75	234
Lone Hill (Moll & Platt)	2	75	30·17	127
May (May Syndicate, Ltd.)	5	460	56·33	237
Medway (F. L. Standen)	5	643	121·10	509
Mediteraneo (Perat & Baburizza)	2	120	46·47	195
Lomagundi district total			2.585·11	10,865

Mazoe District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bella Donna (R. Ricardo)	5	162	46·54	195
Botha H. (Cunningham & Allison)	5	1.300	43·99	185
Do. (sands)	—	690	88·61	372
Glandore (Harries & Cooke)	2	208	77·96	327
Jumbo G.M. Co., Ltd.	30	3.100	487·97	2.070
Do. (sands)	—	2,000	254·48	1,081
Do. (slimes)	—	1.100	64·71	275
Kimberley (Mash.) G.M. Co., Ltd.	8Nis.2T	4,400	862·62	3,649
Do. (sands)	—	1,700	304·45	1.273
Do. (slimes)	—	2,700	196·18	820
Lowland Chief (Brice & Quick)	5	10	6·83	29
Micky (Micky Syndicate)	2	393	95·17	404
Mitre 8 (Bishop's Syndicate)	1D	20	27·90	117
Do. (sands)	—	15	8·35	35
Pannings (B. G. Byerley)	—	—	3·59	15
Pompei A. (A. S. Warwick)	5	988	63·31	266
Puff Adder (Puff Adder Syndicate)	2	200	29·05	122
Do. (sands)	—	540	54·02	227
Ravine (H. O. Coker)	2	150	44·88	[illegible]
Tat & Thornhill (Oceola G.M. Co., Ltd.)	5	560	233·60	981
Do. (sands)	—	280	58·56	246
Umkulu (Head & Manson)	2	260	58·11	244
Venus (Giles & Southey)	2	269	139·82	587
Do. (sands)	—	200	14·92	63
Xmas 1 N.W. (D. Pearce)	2	230	39·03	164
Mazoe district total			3.304·65	13,935

Salisbury District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alpes (P. Zaffere)	5	180	240·40	1.010
Arcturus (L. Chiappini), sands	—	700	76·20	320
Ceylon (Monarch (Tati) G.M. Synd., Ltd.)	5	740	254·91	1.071
Do. (sands)	—	740	40·33	169
Cross Your Luck (S. T. L. Synd.)	2	300	85·13	357
Euchereo (Harrison & Drabble)	2	201	141·50	594
Found A (O. W. Kelly)	3	100	36·79	155
Inyague 3 (Hodge & Von Hagan)	2	150	47·68	200
Do. (sands)	—	500	47·67	200
Louise Grand (H. S. Plant)	1H	1.040	149·41	628
Do. (sands)	—	1.040	92·10	387
Mont d'Or (Claxton & Bussell)	2	154	64·46	271
New Brixton (J. H. Hall)	2	160	91·73	385
New Full Back (New Full Back G.M. Syndicate, Ltd.)	2	180	40·61	171
Old Loyalty (Shamva Hex G.M. Co., Ltd.)	5	330	169·63	712
Olympus C. (D. Perdis)	1H	235	62·17	261
Shamva Mines, Ltd.	56Nis.8T	46,730	No amalgamating tables used, see Note.	
Do. (sands)	—	14,977	1,712·36	7.192
Do. (slimes)	—	31,702	3.625·43	15.226
Salisbury district total			6,978·51	29,309

Note.—Shamva. It is estimated that over £8,000 worth of gold was absorbed in May by new section of plant brought into operation during that month.

Umtali District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Arthur (Mrs. M. L. Hoole)	3	25	13·03	55
Champion (J. Buchanan)	5	720	159·9[illegible]	[illegible]
Do. (sands)	—	450	167·06	702
Do. (slimes)	—	270		
Carndlin (E. K. Evans), sands	—	225	18·85	[illegible]
Fairview 3W. (P. M. Branken)	5	28	25·28	1[illegible]6
Inca (F. Young)	8	375	51·15	215
Kent (E. Evans)	5	560	278·26	1,169
Do. (sands)		47[illegible]	75·[illegible]	315

	No. of Stamps	Tons Treated.	Yield ozs.	Value £
Kings Daughter D.B. (Umtali Waterfall Synd.) (slimes)	—	1.103	81·63	343
Leopard 89 (R. G. Snodgrass)	5	615	1[illegible]	424
Do. (sands)	—	220	26·4[illegible]	111
Maggie W. (F. E. Markham)	5	150	14·81	62
Meanwhile (G. W. Randall)	3	250	25·09	105
Montezuma No. 2 (Montezuma G.M. Co.)	5	373	91·41	363
Do. (sands)	—	300	24·42	94
Pilgrim 2 E. (O. R. Cawood)	5	568	109·2[illegible]	458
Quagga (Quagga Syndicate)	5	235	81·60	343
Do. (sands)	—	930	40·27	169
Queen (G. T. Hopkins)	5	142	22·33	94
Rezende Mines, Ltd.	115	20.800	1.573·57	6 077
Do. (sands)	—	2.762	252·27	1.07[illegible]
Do. (slimes)	—	999	127·68	542
Do. (concentrates)	—	154	574·64	2.410
Surrey (Kerr & Rooke)	5	740	207·55	872
Do. (sands)	—	600	29·32	123
Umtali A. (Umtali Waterfall Synd.)	1[illegible]	308	69·04	290
Do. (sands)	—	31	17·92	75
Do. (slimes)	—	12		
Umtali district total			4.258·82	17.938
VICTORIA DISTRICT—				
Empress A. (S.A. Prospecting and Concession Synd., Ltd.)	5	807	435·62	1.834
Do. (sands)	—	456	146·83	617
Do. (slimes)	—	315		
Grand Slam (R. Schielke)	5	166	19·92	84
Texas (G. Scott)	1[illegible]	1.267	246·76	1.036
Do. (sands)	—	750	99·56	418
Victoria district total			948·69	3.934

SUMMARY.

Gold—	*Ozs.*	*Value.*
Matabeleland	34.657·35	£145.583
Mashonaland	34.325·37	144.479
Total	68.982·72	£290.062

OTHER MINERALS.

	Ozs.	*Value.*
Silver, ozs.	1[illegible].592·1[illegible]	£1.026
Lead, tons	13·73	226
Chrome iron, tons	6.036·80	13.475
Diamonds, carats	142·75	694
Coal, tons (sales)	29.572·00	10.215

Total value May output £315.7[illegible]

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PROGRESS OF THE KONOMAX DRILL.

The Year Reviewed.—Hammer Drills v. Piston Drills.

At the sixth ordinary meeting of shareholders in the Konomax Rock Drill Syndicate, Ltd., Mr. W. S. Thomas, who presided, remarked:—

Soon after the syndicate was formed, many surface and underground tests were conducted, all of which were admittedly satisfactory; but mining men held that the only conclusive test of a rock drill would be to completely equip a mine and compare the work with a drill of a standard design. Through the courtesy of the manager of the Meyer and Charlton G.M. Co., Ltd., we were permitted to equip that mine with our machines, and conduct a test against an equal number of new drills of a standard type. The test was carried out under the auspices of a committee of influential mining men, who were responsible for all the figures and also for the report issued in connection with the test The results obtained demonstrated the remarkable efficiency of your drill, both as regards drilling speed and air consumption. The reasons given by the mines for their not using the drill after this most satisfactory demonstration was that the material of which the drill was manufactured was not up to standard. This point was conceded by your directors, and they then made arrangements with Messrs. Fraser & Chalmers, Ltd., to have the drill manufactured by Messrs. Holman Bros., Ltd., whose material was generally admitted to be the best obtainable. The Rand Mines, Ltd., imported a number of the new drills under their contract with the syndicate, and Mr. J. H. Rider, one of your directors, made arrangements with the Village Main Reef G.M. Co., Ltd., for a test to be conducted in their mine with some of the drills from this consignment. This test was to be more complete than that on the Meyer and Charlton mine, as it was to be for a period equivalent to six months' work on single shift. The results obtained were rather better than in the Meyer and Charlton test, and it was conclusively proved that nothing in our design tends to impair the efficiency of the drill over a lengthy period, and it was also proved that the maintenance on this type of machine would not be more than the maintenance on the old standard type. The next test to which the drill was subjected was in the equipment of the Bantjes Consolidated Mines, Ltd., which has proved conclusively that the Konomax drill will do efficient work under working as well as test conditions. This equipment has also proved that the miners are able and willing to use the Konomax type of drill, and can obtain better results with it than with the old standard types. The Bantjes has been equipped with both sizes of Konomax drills, and the management has reported most favourably on the results obtained. They have lately been experimenting with several type of hammer drills for stoping work, but during the present month have ordered further Konomax drills for stoping. This fact speaks for itself You will therefore see that proof of the merits of the Konomax drill has been established many times over and on every conceivable point. It is difficult under these circumstances to understand why the drill has not been more generally adopted I am convinced that if the managers and officials of the various mines would make themselves thoroughly conversant with the merits of the Konomax drill, and determine from the results of the various tests what saving its adoption will enable them to effect, it would only be a question of time before this drill would replace practically all the piston types now in use. At our last annual meeting the figure given as the approximate saving in air power costs, computed by an eminent engineer, was taken at £200,000 per annum. The bulk of this amount still remains to be saved. Another way of figuring out the amount which may be saved is, that provided the same amount of money be expended in developing air power, the adoption of the Konomax drill, on account of its using less air than other types, will result in an increase of pressure in all parts of the mine. It is a well-known fact that increased pressure means increased drilling efficiency, and increased drilling efficiency should mean reduced working costs. During the labour shortage in the past year, one mine having a limited compressor capacity was enabled by the adoption of the Konomax drill to put a considerable number of extra drills at work and thus maintain its usual tonnage. At the time of our last annual meeting the sales then being made were most satisfactory, and we had every prospect of a considerable amount of business; but soon after there occurred one of those periodical agitations in favour of hammer drills which had the effect of preventing any further introduction of the piston type of drill for the time being. For some months it was found almost impossible to sell, or even give away, a drill of the piston type; but during the past month, the hammer type of drill having apparently again failed to fulfil expectations, Messrs. Fraser & Chalmers, Ltd., report the sale of a considerable number of your drills, and your directors hope that the tide has now turned in our favour. The peculiar result of the hammer drill agitation was that the old inefficient types of piston drills were generally kept at work; though it has been proved that the Konomax drill will pay for itself in the amount of actual money saved within five to seven months. The time in which the Konomax drill will pay for its introduction is calculated without reference to the fact that there is a great saving to be made in maintenance during the first six months of the life of a new drill of any type. Generally speaking, the hammer drills which have been tested during the year are practically the same in design as those which were tested in the Stope Drill Competition, and which have been experimented with from time to time during the past few years. Owing to the conditions on these fields, the hammer type of drill has not been found satisfactory in previous years; and so far as I can learn the tests made during the past year have up to the present time shown no better results than previously. There are, of course, certain limited classes of work in which the hammer type of drill is admitted to be superior; but for general work in the Witwatersrand mines the piston drill, in my opinion, will always prove to be the superior type, and as the Konomax type is so much superior to other piston types, it should be more generally adopted in the future. In our last report it was stated that experiments were being made with a coal-cutting machine, and the thanks of the syndicate are due to Messrs. Fraser & Chalmers, Ltd., and Messrs. Holman Bros., Ltd., for the time and attention they have given to the development of this branch of the business. The results obtained are encouraging, and we are hoping that a good business may result from this device in the near future.

THE WEEK IN THE SHAREMARKET.

Firmer with Increased Enquiry—Effect of Improved Labour Supply and Better Conditions All Round—Brighter Outlook.

A STEADY and almost imperceptible improvement in prices has lately been the feature of the market. The causes are doubtless the good dividends, the improvement in the native labour supply, and the receipt in London of the full details of recent Rand speeches of a confidence-inspiring nature. Quotations became ex-dividend this week, but there are signs that the reduction will not take long to make up. Plainly there is going to be a better market for Rand dividend payers, and the others doubtless will soon participate in the activity. Tins and diamonds remain inactive, and await better markets for the respective products. The outlook, at any rate, all round is brighter than for many a long day.

	Fri., 26th.	Sat., 27th.	Mon., 29th.	Tues. 30th.	Wed., 1st.	Thurs., 2nd.
Adair Ushers	[illegible] 5*	0 5*	—	0 5*	0 5*	—
African Farms	[illegible] 0*	10 1*	[illegible] 0*	10 3*	10 1*	10 3*
Apex Mines	17 0*	17 0*	17 0	16 6	—	16 6*
Aurora West	[illegible]	8 9	8 9	—	8 9*	8 9*
Bantjes Consolidated	—	—	13 0	—	13 9+	11 6*
Blaauwbosch Diamonds	82 6*	83 6	—	82 6*	75 0*	—
Brakpan Mines	[illegible] 6*	—	[illegible]	50 6*	—	47 6*
Breyten Collieries	—	26 [illegible]	—	26 0*	—	24 0*
British South Africa	—	16 3*	16 3	17 3	—	—
Bushveld Tins	[illegible] 8+	0 6*	—	—	0 7+	—
Cinderella Cons.	—	—	5 9	—	—	—
City and Suburban	52 6*	52 9+	—	52 6+	45 6*	46 0*
City Deeps	64 6*	64 9*	64 6*	64 6	62 0*	62 0
Cloverfield Mines	4 3	4 4	4 3*	4 3*	4 4*	4 3*
Cons. Langlaagte	34 [illegible]	34 3*	34 3*	34 3*	32 6*	33 3+
Cons. Main Reefs	[illegible]	18 3	18 6*	18 3*	—	17 6*
Cons. Mines Selection	—	—	—	7 0*	7 0*	—
Coronation Collieries	[illegible] 0*	—	[illegible] 0	18 0*	—	—
[illegible] Freeholds	—	—	—	—	—	0 3
Coronation Syndicate	—	3 0*	—	—	—	3 0
Durban Road Deeps	[illegible] 0*	17 6*	—	18 0*	—	—
East Rand Centrals	1 9*	1 [illegible]	1 10*	1 10	1 10*	1 9*
East Rand Coals	1 6*	1 6	1 6*	1 6*	1 6*	1 6*
East Rand Deeps	1 6*	1 8+	1 6	1 6*	1 6	1 6
East Rand Mining Est.	—	—	—	3 3*	—	—
East Rand Props.	—	33 6*	—	33 0*	32 0*	—
East Rand Debentures	—	—	—	£89*	—	—
Eastern Gold Mines	1 0	1 [illegible]	1 0*	1 0*	1 0*	1 0*
Frank Smith Diamonds	2 2*	2 4*	2 4*	2 6	2 6*	2 6*
Geduld Props.	23 9*	24 [illegible]	23 9*	23 9	24 3+	23 9*
Glencairns	—	—	6 0*	—	—	—
Glencoe Collieries	—	6 0*	—	6 6*	—	6 0*
Glynn's Lydenburg	10 [illegible]	[illegible]	10 [illegible]	10 0*	10 [illegible]	10 0*
Goerz & Co.	—	9 0*	—	—	—	—
Government Areas	22 9*	22 [illegible]	23 3	23 3*	23 3	23 3
Jhb. Board of Executors	23 6+	23 [illegible]	23 6+	23 6+	23 6+	23 6+
Jumpers	—	4 [illegible]	—	—	—	—
Jupiters	[illegible] 6+	4 [illegible]	4 3	4 3	4 3	4 0*
Kaalfontein Diamonds	0 [illegible]	[illegible] 3	[illegible] 3	0 3*	0 3	0 3*
Kleinfontein Estates	—	20 [illegible]	20 [illegible]	—	—	—
Klerksdorp Props.	2 7	2 [illegible]	2 7*	2 7*	2 7*	2 7*
Knights Centrals	7 [illegible]	7 [illegible]	[illegible]	7 10*	7 [illegible]	7 9*
Knights Deeps	—	[illegible]	—	—	—	—
Lace Props.	3 [illegible]	—	3 [illegible]	3 [illegible]	3 [illegible]	—
Langlaagte Estates	—	—	—	[illegible] 6	—	—
Luipaardsvlei Estates	[illegible] 6	[illegible]	[illegible]	9 9*	[illegible]	10 0
Lydenburg Farms	2 [illegible]	2 [illegible]	2 [illegible]	3 [illegible]	3 0*	3 1*
Main Reef West Debs.	—	£71*	—	£7[illegible]	—	—
Main Reef West	6 [illegible]	6 [illegible]	6 11*	6 [illegible]	6 9*	7 0
Meyer and Charlton	117 [illegible]	117 [illegible]	117 [illegible]	116 3*	110 [illegible]	110 0*
Middelvlei Estates	—	1 4*	1 4*	1 5	1 4*	1 6+
Modderfontein B	[illegible] 0*	[illegible]	[illegible] 0*	[illegible] 0*	—	—
Modderfontein Deeps	[illegible]	53 [illegible]	54 6*	54 6*	53 9*	54 6*
Natal Navigation Colls.	—	15 [illegible]	—	—	—	15 0*
National Banks	—	[illegible]	[illegible]	238 0*	240 0*	242 0*
New Boksburg	[illegible]	[illegible]	0 10*	[illegible] 10*	0 10*	0 10*
New Eland Diamonds	—	28 [illegible]	24 [illegible]	—	—	—
New Era Cons.	[illegible]	[illegible] 3+	5 [illegible]	5 9*	6 [illegible]	5 [illegible]
New Geduld Deeps	[illegible]	1 [illegible]	1 7*	1 8	1 7*	1 7*
New Goch	[illegible]	[illegible]	[illegible]	[illegible]	16 [illegible]	16 [illegible]
New Heriots	[illegible]	[illegible]	[illegible]	[illegible]	57 [illegible]	57 [illegible]
New Kleinfontein	24 0	24 3	24 [illegible]	24 [illegible]	22 6	—
New Modderfontein	[illegible]	[illegible]	[illegible]	—	—	
New Rietfontein	—	3 [illegible]	—	—	—	—
New Unified	—	[illegible]	—	—	—	—
[illegible] Diamonds	1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]
Pigg's Peak	[illegible]	[illegible]	[illegible]	[illegible] 9*	9 [illegible]	[illegible]
Pretoria Cements	[illegible]	[illegible]	[illegible]	[illegible] 6	42 6*	
Princess Estates	6 [illegible]	[illegible]	[illegible]	5 [illegible]	5 [illegible]	5 6*
Rand Collieries	[illegible] 6*	—	2 [illegible]	2 [illegible]	—	—
Rand Klip	—	2 [illegible]	2 4	2 1	2 [illegible]	2 4
Rand [illegible]	—	[illegible]	1 [illegible]	1 [illegible]	1 [illegible]	[illegible]

	Fri., 26th.	Sat., 27th.	Mon., 29th.	Tues. 30th.	Wed., 1st.	Thurs., 2nd.
Randfontein Deeps	3 6*	3 7*	3 7*	3 7*	3 7*	3 7*
Randfontein Estates	18 9*	18 0	18 0*	18 6	19 0	19 0*
Roberts Victors	—	15 0*	15 0*	15 0*	15 0*	15 0*
Robinson Deeps	31 6	32 0*	31 6*	—	33 3†	32 6†
Rooiberg Minerals	21 6†	—	21 0	21 3	19 6*	20 0*
Roodepoort Uniteds	—	—	—	—	8 0†	8 0†
Ryan Nigels	2 7*	2 7*	2 7*	2 7*	2 7*	2 8*
Simmer Deeps	1 0*	1 0*	1 1*	1 1*	1 1*	1 1*
S.A. Lands	2 6*	2 6*	2 6*	2 6*	2 6*	2 6*
Springs Mines	11 0	10 9*	10 9*	10 9*	10 9*	11 3*
Sub Nigels	—	10 6*	10 3*	10 3*	11 0	11 0*
Swaziland Tins	—	—	32 6†	—	—	—
Transvaal Coal Trust	30 0*	29 6*	31 0	30 0*	28 0*	29 0*
Transvaal G.M. Estates	36 0*	36 0*	36 6*	37 6*	36 6*	36 0*
Tudors	—	—	1 0*	—	1 0*	—
Van Ryn Deeps	46 0*	46 0*	46 0	45 9*	43 6*	43 6*
Village Deeps	38 9*	—	39 3*	—	—	37 6*
Village Main Reefs	—	38 9*	40 0†	40 0†	—	—
Vogelstruis Cons. Deeps	—	0 9*	0 6*	0 9*	—	—
West Rand Cons.	—	8 0*	8 3*	8 0*	8 6*	8 6*
Witbank Collieries	43 0*	—	43 0*	45 0*	44 6*	44 6*
Witwatersrands	—	70 6*	71 6	70 6*	—	—
Witwatersrand Deeps	48 0*	48 0	48 0*	49 0*	46 6	46 0*
Wolhuters	14 0*	14 0*	14 0*	14 1*	14 1*	14 3
Zaaiplaats Tins	23 0	23 0	23 0*	23 0*	23 0*	23 3
Union 3½ per cent. Loan.	—	£96½*	£96½*	£96⅝*	£96½*	£96½*
Union 4 per cent. Loan	—	£98¾*	£98½*	£98⅝*	£98½*	£98½*

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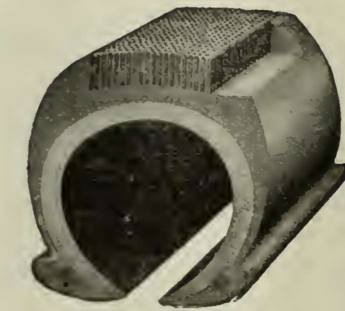

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CONTENTS.

PAGE
Notes and News 509
Topics of the Week:
Rand Native Grievances 511
" Safety First " Progress 512
The Government Areas' Profit Prospects 513
The Manager and Staff of the West Rand Consolidated Mines, Ltd. 515
Stamp Duty in May over Nine Tons 516
Correspondence and Discussion: " Tin Shareholders' Thanks "; " Leeuwpoort Tin Dressing Plant " ... 516
The Position of the Messina Development Co., Ltd. ... 517
Resuscitation from Electric Shock 517
The June Output: Group Returns 518
Rand Water Board Annual Report 519
Group Profits in June 520
Rhodesian Section:
Latest Mining News 521
The Week in the Sharemarket 522
Engineering Notes and News 523
Coal Mines Rescue Stations—II. 524
Finance, Commerce and Industries 526
Automobile Notes 528

Notes and News.

The June Output: A Small Decline.

As was only to be expected on acount of the shorter running time, the gold output for last month has been declared at a figure below the May total. The decrease is, however, so small that it may practically be accounted negligible, and a considerable increase in the average daily yield is evident. The gold output of the Transvaal for the month of June was declared yesterday at noon to be 717,926 ozs., or in value £3,049,558, as compared with 720,229 ozs., or £3,059,340 in May. The decline for the whole Province amounts therefore to 2,303 ozs., or £9,782. For the Rand the June totals are 688,232 ozs., or £2,923,425, which show a decrease over the preceding month of 1,027 ozs., or £4,364. Outside districts contribute 29,694 ozs., or £126,133, which is a decrease by 1,276 ozs., or £5,418 below the May return.

* * * *

Municipal Stupidity.

The arrangement of the toast list at the citizens' banquet to Lord Gladstone last week was a sorry example of how not to do it. In the first place the number of speeches was out of all proportion to the patience and interest of those present; and the order of arrangement of the list bore other evidence of having been entrusted to the tender mercies of the Municipal office-boy. Possibly we may take an exaggerated view of the importance of the mining industry, but it does seem all wrong that the speech of the President of the Chamber of Mines should be relegated to a place so low down on the list that by the time it is reached the bulk of the audience is worrying more about bed than about the big problems of the Rand. In the public mind, Municipal methods are often regarded as synonymous with bungling and stupidity and after the display at the Gladstone banquet there is really something to be said for that view.

* * * *

Modderfontein Deep Levels Development.

The following are particulars of work done on the property of the Modder Deep Levels:—During the quarter ended June 30 last, 5,489 feet were driven, risen or sunk, inclusive of 235 feet sunk in the main incline shaft; 4,980 feet were sampled, showing an average assay value of 9·6 dwts. per ton over 50 inches. Since the commencement of development work, a total of 26,327 feet has been driven, risen or sunk, of which 21,472 feet have been sampled, and show an average assay value of 9·2 dwts. per ton over 46·8 inches. The erection of the surface plant and necessary work underground in preparation for the commencement of crushing is progressing satisfactorily.

* * * *

East Rand Extension.

The report of the East Rand Extension, Ltd., for the year ended March 31 last states that no opportunity has presented itself for making such financial arrangements as would lead to the resumption of mining operations at the property. The mine equipment, plant, buildings, and machinery have been maintained in good order against such time as work can be restarted. The amount of the loan at the close of the year was £188,489, an increase during the year of £11,406. The profit and loss account shows a net profit of £875, which reduces the debit balance to £20,648.

* * * *

Globe and Phoenix.

The new headgear of the vertical shaft at this property has just been completed. The structure is a very heavy and imposing affair of timber, and it is expected that at an early date now operations in this section of the mine will be in full swing. We understand that underground connections with this shaft have now been made, and it has been anticipated that the Government embargo in regard to limited shifts will accordingly be removed. Development is reported to continue to disclose ore of very high value. The recovery in May from 6,546 tons milled was £31,343.

Mount Anderson.

In the *Union Government Gazette* published this week warning is given to prospectors and others proceeding to Mount Anderson, district Lydenburg, in the mining district of Pilgrims Rest, that communications in the district are difficult, and that shelter and stores are unobtainable. Prospectors and others are consequently advised not to go into the district unless well equipped to withstand a rigorous climate.

* * * *

Premier Diamonds.

Comment has been attracted to the fact that the directors of the Premier (Transvaal) Diamond Mining Company have made a "cut" in the interim dividend declaration on the Deferred shares for the year ending 31st October next, and the halving of the distribution, as compared with a twelvemonth ago, is certainly drastic. For the whole of 1912-13 holders received 18s. 9d. per share, but the present interim distribution of only 5s. gives little hope of anything like the balance being made up for the current year. Besides the recent severely adverse conditions of the diamond trade, the directors of the Premier have had to face the defeat of the South African Government's proposals to exempt the company from the operation of the new Cape income tax. The chief hope for the future is the chance of favourable results to the trade in the stones as the outcome of the Diamond Producers' Conference now sitting in London.

* * * *

Victoria Falls Power Results.

The report of the Victoria Falls and Transvaal Power Company for 1913 shows a profit of £467,800, an increase of £21,400. The improvement would have been greater but for the strike which occurred in the Transvaal during the period under review. It is proposed to pay twelve months' dividend on the preference capital, thereby bringing matters up to the end of 1912, leaving £105,200 to be carried forward, in which is included £96,800 brought over from 1912. There is a disposition in some quarters to criticise the administration of the undertaking, owing to the fact that no progress has been made during the past twelve months in respect of reducing the preference arrears. The directors are, however, entitled to reply that, under very adverse conditions, they have done all that is to be reasonably expected of them in the shareholders' interests, and not altogether without success, while there is a reasonable prospect that this year they will be able to do much better. New machinery of the capacity of 30,000 h.p. has recently been brought into service at Simmerpan, the extensions at Rosherville in connection with the air system will shortly be in commission and the installation of the additional plant at Brakpan is progressing rapidly and will be available by the end of the year. Judgment has been given against the company in the action brought by the Consolidated Langlaagte Mines, Ltd., for about £29,000. The company has appealed to the Appeal Court against the judgment, and the matter is therefore *sub judice*. The directors regret to record the death of two of their colleagues, Mr. Hans Schuster and the Hon. J. R. Delap Tollemache. The Board has appointed Mr. Frank Astley Cooper a director.

* * * *

Dividend Fluctuations.

In our last issue we gave a list of dividends declared by all Transvaal gold mines for the first half of the current year. It may be recalled that the aggregate for the Rand amounts to £4,052,449 as compared with £3,965,549 in the corresponding period of 1913. It may here be of interest to note the major fluctuations in the declarations of the companies as between these two periods. Coming first to the mines under Corner House control, it is to be observed that the Bantjes, Crown Mines, Ferreira Deep, New Modder, Village Deep and Village Main Reef record the same amounts as twelve months ago. Increases are recorded by the City Deep, Nourse Mines, Modder B. and Robinson. By far and away the largest increase is that of the Robinson, which in addition to improving its ordinary dividends announced a 10 per cent. bonus. The other subsidiaries show declines, but none of them very serious, the largest decline being that of the Rose Deep, £35,000. The City and Suburban dividend at £102,000 is the same as that announced in respect of operations for the first six months of last year, but the New Heriot declaration is £5,750 less. The three declarant companies under Neumann control show no variation, but in the case of the E.R.P.M. the decline is heavy and the rate 5 per cent. less. The New Kleinfontein, which, on account of strike troubles, announced no dividend last half year, now pays out £57,577. The Meyer and Charlton shows improvement by £10,000, the Van Ryn's distribution is 22½ per cent. as against 25 per cent. The Brakpan Mines declaration involves £93,750 as against £150,000, that of the Langlaagte Estate £44,325 as compared with £66,487, whilst the Randfontein Central, for reasons already explained, is absent from the list. As to the Barnato subsidiaries, the Van Ryn Deep and Consolidated Langlaagte, which did not figure in the list for the first half of last year, distribute £149,611 and £95,000 respectively. The declarations of the New Unified and Knights remain the same, whilst those of the Ginsberg and New Primrose are less. The three Gold Fields mines show declines, large in the case of the Simmer & Jack and Knights Deep, and comparatively small in the case of the Robinson Deep. The Durban Roodepoort rate at 10 per cent. remains unaltered.

* * * *

Luipaardsvlei Estate.

The circular issued last week by the London Board of the Luipaardsvlei Estate has called attention to the greatly improved position of that company. The increase of the crushing capacity up to 22,000 tons per month, coupled with the opening up of a rich section of battery reef, gives promise of a higher grade of ore and steady growth in the profits. The directors' promise of a dividend is justified by the sound cash position of the company, the available balance being approximately £42,000 after buying in £8,000 debentures now redeemable. The June profit, it will be seen, is well over £4,000. It is noteworthy that at the last annual meeting in November, 1913, Mr. J. A. Cohen said, *inter alia*:—

> A careful study of the Eastern, or Windsor, section of your property has enabled the management to embark upon a progressive development policy, the cost of which is to be borne by the development charge, and it is not contemplated that this will interfere with the present scale of working costs. Much study and attention has also been given to the Battery Reef, a well known, although somewhat erratic, gold-carrier. Recent assays taken from the winze have disclosed 8·8 dwts. over 42 inches. It is the intention of the management to advance the development here, when we confidently hope a valuable tonnage will be disclosed. Any success in this direction should have the effect of raising the average grade of your mine. Too much importance need not be attached to the fact that at present you possess a low-grade property, as, given reasonable mining facilities, applied with good management, there is no reason why shareholders should not see a steady increase in the monthly profits. The additional factor, however, must be tonnage. It is for that reason that the board of directors have decided to increase your equipment by the installation of two additional tube mills, so as to admit of increasing your monthly tonnage from 17,000 to approximately 21,500 tons per month, which, in the opinion of the general manager, is fully justified by the present state of your ore reserves. The cost of same will be defrayed out of last year's profits. As to the future, it is always dangerous to prophesy, particularly when dealing with a mining venture, and as I do not wish to make any statements that may not be borne out by actual results, I will content myself by saying that, provided nothing untoward happens, this company should be in a position to declare a dividend at the close of the current financial year, *i.e.*, June, 1914. I base this view on the company's present returns, due allowance being made for the improvement which will set in after the new tube mills have been brought into commission, which should be towards the spring of next year.

* * * *

A Remarkable Labour Position.

A somewhat remarkable state of affairs appears to at present obtain in Southern Rhodesia in regard to native labour. Apparently there is a very considerable surplus of natives, and at the annual meeting of the Rhodesian Native Labour Bureau held in Bulawayo the other day Mr. Wrey, who presided, spoke of the 2,000 odd boys in the compounds of the Bureau at the present time. The consequent additional cost to the Bureau must of course be considerable. An examination of the facts shows that three years ago, when the re-constructed Bureau came into being, its financial arrangements were based on a required annual supply of 14,000 native recruits, in the proportions of 60 per cent. and 40 per cent. to the mining and agricultural industries respectively, and it might have been supposed that the requirements, with the passing of time, would have gone on increasing. They have not done so, and it appears that the total number of labourers supplied last year was 13,563, all of whom it may be noted were recruited north of the Zambesi. During the year reviewed there were recruited 2,061 labourers in excess of those repatriated. But as work on the mines and the farms was not expanding at the rate expected, it appears that the Bureau was gradually accumulating a surplus of "boys" in its compounds for whom engagements could not be found. Here on the Witwatersrand the great bugbear of scarcity of native labour continues. It is common knowledge that the operations of several important companies are seriously handicapped by lack of sufficient "boys," and it might therefore well be asked if the contradictory state of affairs existing as between the two territories could not be so adjusted by arrangement that the Transvaal would secure a portion at any rate of the surplus of Southern Rhodesia. It is, to say the least of it, distinctly anomalous that whilst operations on several of the Witwatersrand mines have to be curtailed because of insufficiency of coloured unskilled labour, the Rhodesian Native Labour Bureau should be put to considerable expense in maintaining within its compounds more natives than the industries of the country can at present absorb.

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National Diamonds: A Further Reconstruction Scheme.

Further readjustment of the finance of the National Diamond Syndicate is now proposed. We have in one or two previous issues dealt with the various stages of reconstruction through which the syndicate has gone, and it is now of some interest to observe that in the *Government Gazette* of July 5th notice is given that an extraordinary general meeting of the syndicate will be held on July 28th. At this meeting certain resolutions will be proposed as extraordinary resolutions. The more important of these are as under:—

That the capital of the company be, and it is hereby, reduced from 340,000 shares of 10s. to 340,000 shares of 1s. each. That the new capital of the company, amounting to £17,000 as aforesaid, be increased to £50,000 by the creation of 1,000,000 shares of 1s. each, and that the said 1,000,000 shares be allotted and distributed as follows: To the existing shareholders of the company 340,000 shares of 1s. each, to be distributed among them in the proportion of one share in the new capital so increased for every one share now held by the shareholders, and in lieu of and in exchange for the shares so held. For working capital, 400,000 shares of 1s. each, to be allotted to the guarantors or subscribers of such working capital. To the guarantors of the aforesaid working capital, as a commission for guaranteeing the said working capital, 100,000 shares of 1s. each. For reserve capital, 160,000 shares of 1s. each The guarantors of the working capital shall have the right at any time within eighteen months from the date of confirmation of the reduction of the capital to £17,000 to call upon the company to increase the capital by 200,000 shares of 1s., and upon such demand the directors may so increase the capital and the directors shall be authorised, and are hereby empowered, to issue 100,000 of the said shares to the guarantors at par, and the remaining 100,000 shares to the guarantors at the price of 1s. 6d. per share. The guarantors of the working capital shall have the right to take up the 160,000 reserve shares of the company at par at any time within twelve months from the date of the reorganisation of the capital of the company by its increase from 340,000 shares of 1s. each to 1,000,000 shares of 1s. each.

* * * *

Lydenburg Estates, Ltd.

In an official circular, the secretary, Mr. J. M. Mackay, states that by the South African mail received on the 19th ult., the directors were advised of the striking of gold on the company's farm, Hartebeestvlakte, and of the despatch of two samples of reef matter. These samples arrived on the 20th ult., and on the same day the directors held a meeting at which it was decided to send them for analysis to Messrs. Johnson Matthey & Co., Ltd., who have now completed the gold and silver assays of the samples in question, the results being as under:—No. 1 lump: 1,160 ozs. 13 dwts. gold; 38 ozs. 11 dwts. silver. No. 2 pieces and powder: 12 ozs. 1 dwt. 6 grs. gold; 1 oz. 5 dwts. silver (per ton of 2,240 lbs.) The secretary adds:—"In view of the exceedingly favourable nature of the assays, the directors have cabled their agent for further information. No reply has yet been received to that cable, but your directors have considered it their duty to at once communicate the position to the shareholders. The directors prefer to express no opinion in the meantime upon the discovery until receipt of fuller information."

TOPICS OF THE WEEK.

RAND NATIVE GRIEVANCES.

The complete report of the Native Grievances Enquiry by Mr. Buckle, now available, corrects several misconceptions due to telegraphed summaries and hastily formed judgments of politicians in a hurry. After the industrial troubles of last year, Mr. Buckle, it will be remembered, was appointed as a Commissioner with the following reference:—"To investigate the conditions under which natives are engaged for and employed on the mines of the Witwatersrand, and if any grievances or abuses be found to exist to make recommendations with a view to the removal thereof; to inquire into the control capable of being exercised over natives housed in compounds in the Witwatersrand area and to make recommendations as to what measures should be taken with a view to safeguarding life and property in the event of any industrial or other unrest or disturbance." In other words, the object was to ascertain whether the native mine labourers, as a class, suffered under any generic disabilities, and, if possible, to suggest means by which these might be remedied in the future. At the outset Mr. Buckle points out that a great part of the evidence was given by natives. He had not previously had any wide experience of native evidence, and was, at first, a good deal puzzled by some of the stories told. "I now think," he says, "that while the native does not very often invent a story entirely, he will frequently, upon a very small foundation, build up a magnificent superstructure of fiction. At one mine there was, a week or two before I heard the complaints of the natives employed thereon, a disturbance between the natives and the police, in which one of the former was, unhappily, killed. Anyone reading the evidence given to me by some of the natives would think that the police made it a regular practice to shoot the inhabitants of that compound." Mr. Buckle goes on to state also that natives habitually speak of past conditions as if they were still continuing. For example, on one mine, practically the only complaint was that hammer-boys were employed upon lashing work until noon, or thereabouts, so that they had no reasonable chance of drilling the 30 inches which is the minimum for which they get paid. The actual fact was that this had been the case under the previous management; but it is quite clear that, for many months they had no serious grievance upon this ground. The complaints which the Commissioner received at that mine had been remedied long before they were made to him. "In consequence of this tendency," he says, "some of my recommendations may deal with abuses which have already ceased to exist. On the other hand, they may survive here and there, and it is, therefore, useful to bring the possibility to the notice of those responsible. I have also found it quite impossible to rely upon native statements dealing with figures or hours." Mr. Buckle then proceeds to make a preliminary pronouncement, the importance of which cannot be over-emphasised. "This report," he says, "in consequence of the terms of reference, is necessarily occupied with a discussion of those points in the treatment of the native mine labourer which are or are said to be defective. It may, therefore, easily give to the reader the idea that the native's lot is entirely composed of hardships, and that his treatment is very bad indeed. I wish definitely to repudiate any such opinion. Since I entered upon this inquiry I have been astonished to learn how much care and thought is expended upon the native labourer's health and comfort; and all witnesses with any long experience of the mines—including every class and colour—are absolutely unanimous in the assertion that the improvement in the conditions of the native labourer on the Rand has been enormous and continuous." He adds that a considerable number of the complaints made have been remedied during the sitting of the Commission as a result of their being brought to the notice of the managements concerned. Mr. Buckle proceeds to examine in minute detail the complaints made under various heads and he includes at the end a summary of his principal recommendations. "Various other suggestions," he says, "which cannot conveniently be summarised, will be found in the report itself. It should be understood that the recommendation of a certain course by no means implies that it is nowhere in use at present; on the contrary, many recommendations are taken from the existing practice of one or more of the mines." It is abundantly clear from all this that it is wholly wrong and unfair to describe Mr. Buckle's report as a "damning indictment" of the mining industry, or as a sweeping condemnation of existing methods on the Rand. Native grievances, of course, Mr. Buckle finds in plenty; and these he discusses and analyses with great sympathy and insight. Mr. Buckle does not regard the "colour bar" favourably; but he does not go into the question very deeply. He points out, however, some ways in which avenues of advance can be opened up for the native without the removal of the colour bar. In particular, he advocates the extension of the piece-work system, under which pay increases automatically with efficiency. He suggests also that properly trained native hospital attendants and native clerks, who could be relied upon as intelligence officers, "would be economically worth a good deal more than the present rate paid to natives doing these classes of work." The importance of opening up some avenues of promotion as a means to securing a permanent native labour force in the Rand area will increase as the natives come increasingly under the influence of civilisation. It is not only in large matters, such as insistence on the colour bar, that the intervention of the white miner between the native labourer and the employing companies gives rise to grievances. In a number of details the miner has it in his power to make things easy or difficult for the native labourer. In regard to the much-criticised present method of recruiting labour for the mines, Mr. Buckle says it is not practicable at present to rely upon voluntary (i.e., unsolicited) labour entirely, and it is necessary to consider some other method of meeting the objections—to recruiting. Further, Mr. Buckle says that he does not see "why recruiting in its essential form ought to be abolished." "It is desirable from every point of view that the native should work, and there is, therefore, nothing improper in persuading him to do so." Cause for complaint and criticism arise in fact not from the system itself, but from the abuses which are connected with it. The main objections to the system as it is actually operated are (1) that it necessitates engaging natives on long contracts; (2) that recruiters sometimes induce natives to contract by false representations or by promises which are not fulfilled; and (3) that the recruiters, by giving excessive credit to the natives themselves or by bribing the chiefs, virtually compel boys to go to the mines. Mr. Buckle goes on to mention as one of the objections urged against recruiting that "many of the recruiters are traders, and the prospect of obtaining capitation fees for natives sent to the mines induces them virtually to enslave natives by extending to them excessive credit." His comment on this is that "there is no doubt that recruiters who are also traders do extend to natives an amount of credit which they would not do, but for the prospect of inducing them to go to the mines, and thereby to earn a capitation fee for the trader. Since debt is an habitual vice with most natives, anything which tends to encourage them in the habit is an evil." The Commissioner recommends as measures for minimising the evil, the gradual abolition of advances and the substitution of deferred pay, and the abolition of the capitation fee paid to recruiters. He also suggests the prohibition of credit between Europeans and natives; and though he finds an obstacle to the carrying out of this suggestion in the fact that "the native at his kraal, being largely dependent upon very variable harvests, has legitimate need of a certain amount of credit," it has been tried in Basutoland, and the difficulties in the way of extending it do not seem to be insuperable. The adoption of these measures would diminish very materially the opportunities of recruiters for exercising undue pressure upon natives in order to force them to go to the mines, and the most objectionable features of the system as at present practised would disappear. It is impossible in this short review to do justice to all the important points of Mr. Buckle's masterly report. There is much in it for further and future consideration. Enough has been quoted, however, to indicate the value of the work so thoroughly done, and the real practical helpfulness of many of the impartial suggestions made.

"SAFETY FIRST" PROGRESS.

EXCELLENT progress is still being made by the "Safety First" movement, and in the next few weeks we hope to publish detailed particulars of the directions in which the activity of the promoters are now advancing. The lectures recently delivered by Mr. A. M. Archbold are being reprinted, and will be circulated broadcast on the Reef. Moreover, the engagement of a whole-time lecturer and whole-time accident-prevention inspector, is being considered. These steps, of course, all involve the expenditure of money, but there is no reason to doubt that it will be money well spent. In this connection, it is noteworthy that Mr. Buckle, in his report on Native Grievances, goes into the question of accidents in relation to the mine native, and makes some important recommendations. In elaborating these recommendations, Mr. Buckle points out that there have been complaints from various mines that natives have been compelled to work in stopes which they considered dangerous, in spite of warnings given by them to the miner in charge; and there are authenticated cases where a subsequent accident has shown that the natives were right. It is, of course, necessary, when there is a difference of opinion as to the safety of a working place, that someone on the spot should have the right to decide whether it is or is not safe; and clearly the decision of the superior must overrule that of the subordinate. He thinks, however, that it should be a rule that, where any dispute on the point arises, the miner should not decide it upon his own responsibility, but should send for the shift boss, if practicable, or at least for another European, so that no native should be compelled to work in a place about which he is doubtful, unless there are two opinions in favour of its safety. To omit this precaution should, in the event of an accident, be treated as negligence. It is further necessary, he says, to impress on all concerned the serious responsibility incurred in giving and acting upon such an opinion; and this can best be done by ensuring adequate punishment in cases where accidents do actually happen after such warnings have been disregarded. Every accident involving death or serious injury is required by the Mining Regulations to be reported to the Mine Department and inquired into by an Inspector of Mines. Such reports, however, are not always made; there have been prosecutions for contravening the regulations; and, since these, of course, only occur when the omission is detected through other sources of information, it may safely be inferred that there are undetected cases. Naturally, this has not been stated in evidence; but, from what has been said unofficially, Mr. Buckle has no doubt of the fact. Mr. Kotze, the Government Mining Engineer, states, however, that, in his opinion, the fact that the accident rate has been increasing while the accident death rate has been decreasing, suggests that omissions to report are becoming less frequent. The limitation of working hours, Mr. Buckle also opines, to eight a day makes it difficult to allow the natives to go to work at once as each of them gets down. On some mines it takes as much as two hours to lower all the natives, so that they would be starting work at very varying times, and would have to be stopped also at varying times, which may not always be practicable. Still, if, before any native enters the mine, the working-places have been examined and made safe, there is no longer any necessity to take precautions to keep labourers out of them, even though it may not be possible to make full use of the additional working time thus gained. Mr. Buckle comes to the very reasonable conclusion that "there is every probability that the mines will find the cost of any reasonable precautions against accidents well repaid by the increased popularity which will result from a reputation among the natives for scarcity of accidents. Mr. Lloyd, of the W.N.L.A., thinks that it will not make much difference in this respect, as the native is something of a fatalist. Mr. Lloyd's experience, however, is mainly of East Coast natives. I cannot help thinking that the more advanced Cape Colony native will consider such matters." Mr. Buckle's recommendations will, in this respect, be read with interest by all concerned; and will go far to strengthen the hand of the "Safety First" Committee of the Rand Mutual.

THE GOVERNMENT AREAS' PROFIT PROSPECTS.

Six Shillings per Ton or 12½ per cent. Indicated—Early Fruits of State-cum-Company Partnership in Gold Mining—Curious Feature of the Taxation Scheme.

In view of the likelihood of the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd.—or as the property is better known, the "Government Areas" or "State Mines"—commencing crushing operations in November next it should be of interest to reconsider the profit and dividend paying prospects of the mine as determined by the ingenious scheme of taxation devised by Mr. Gustav Imroth on behalf of the Johannesburg Consolidated Investment Company and accepted by the Government with the result that the exploitation of the Government Areas has been left to the House of Barnato.

State-cum-Company Partnership.

The commencement of milling operations at the Modderfontein State Mines will be an event of very special interest to this country, inasmuch as it will inaugurate a period of revenue for the Government and for shareholders in the company on a State-cum-Controlling Corporation basis of partnership and some investigations of the figures relative to probable revenue, working cost, gross profit, net profit to shareholders, and contributions to the Government in respect of both primary and super tax should prove interesting. The company was registered early in 1910 with a capital of £1,400,000 and secured the exclusive right to mine the precious metals upon 2,633 claims of the farm Modderfontein No. 167, in the mining district of Boksburg.

Outlines of the Taxation Scheme.

The consideration payable to the Government for cession of the claims was a sliding scale tax on profits. Following is a summary of the outstanding features of the agreement signed by the Government and the Johannesburg Consolidated Investment Company:—Under the conditions of lease the company shall pay to the Government (a) a tax on the annual net produce obtained from the working of the said claims calculated in accordance with the sliding-scale referred to hereafter; and (b) an additional tax as below. Such net produce shall be taken to be the value of the precious metals produced after deduction therefrom of the cost of production and of such sums as may be allowed in respect of the exhaustion of capital. The sliding-scale before mentioned shall be such that under it the tax payable to the Government shall bear the same ratio to the net produce as the latter bears to the value of the precious metals produced; provided, however, that in no case shall the tax payable to the Government under such sliding-scale be less than 10 per cent. or more than 50 per cent. of such net produce. The additional tax referred to above shall be such that whatever amount may be payable to the Government in accordance with the sliding scale, the lessee shall pay to the Government a further amount computed as follows:—(a) Seven and a half per cent. of the tax payable under the sliding scale, if such tax does not exceed 20 per cent. of the net produce; (b) 10 per cent. if such tax exceeds 20 per cent. but does not exceed 33⅓ per cent.; (c) 17½ per cent. if such tax exceeds 33⅓ per cent. but does not exceed 49 per cent.; (d) 22½ per cent. if such tax exceeds 49 per cent. of the net produce. No tax is payable under the Profits Tax (Gold Mines) Proclamation, 1902. On the termination of the lease by the exhaustion of the precious metals, the Government shall be entitled to 10 per cent. of the net proceeds derived from the disposal of or of the value of the residual plant, buildings, and equipment of the company.

Revenue, Costs and Profits.

What is likely to be the revenue of the company? And what will working costs and the probable profit work out at? As to the first point it was announced at the annual meeting held a few weeks ago that the ore reserves at the end of April amounted to 1,241,924 stoping tons, valued at 6·35 dwts. It was declared that the recovery value will probably work out at 28s. per ton. Next as to costs: It is not practicable at this juncture in the affairs of the company to advance any very hard and fast estimate as to the probable rate of working expenditure. But at the same time some approximate estimate of costs can be arrived at by considering the working expenses of surrounding mines. To the north lie the properties of the Modder Deep Levels, the New Modderfontein, and the Modder B. Eastwards the claims of the Government Areas are bounded by the Geduld Proprietary, and on the west is the Van Ryn Deep, with the Brakpan Mines below that property. The working expenses of these mines in the month of May are reflected in the following table:—

	Tons Milled.	Total Working Costs.	Working Costs per Ton exclusive of Developm t.	Development Costs per Ton Milled.	Total Working Costs per Ton Milled.
New Modderfontein	52,250	40,684	14/1	1/6	15/7
Modder B.	35,000	27,251	14/1	1/6	15/7
Geduld	20,010	24,038	20/9	3/3	24/0
Brakpan	52,070	48,936	16/4	2/6	18/10
Van Ryn Deep ...	42,080	35,584	14/11	2/0	16/11

From these figures it seems reasonable to assume that working expenditure will be about 18s. per ton, leaving a profit of 10s. per ton milled. It is now necessary to refer again to the preceding text relative to taxation which defines the primary taxation in the following words:—"The sliding scale before mentioned shall be such that under it the tax payable to the Government shall bear the same ratio to the net produce as the latter bears to the value of the precious metals produced." It will be apparent that on the basis of 28s. per ton recovery and 10s. per ton profit, the profit is 35·7 per cent. of the recovery and the tax payable to the Government is 3·57s. The super taxation referred to in clause (c) now comes into effect; that is to say the Government secure a further 17½ per cent. of the primary tax which in this instance means an additional ·624s. That is to say, the total tax payable to the Government is 3·57s. + ·624s., or 4·194s. On this basis then of 28s. per ton recovery and 18s. per ton costs, the apportionment of the revenue would be:—

Working Expenses	18s.
Government Taxation	4·194s.
Shareholders' Profit	5·806s.

In other words, shareholders would receive 5s. 10d. per ton. It may be observed that the "net produce" shall be interpreted as "the value of the precious metals produced after deduction therefrom of the cost of production and of such sums as may be allowed in respect of the exhaustion of capital." The Modder Government Areas is an enormous property and considered at a rate of exhaustion of 50,000 tons per month the life of the 2,633 mining claims is obviously so long that the incidence of amortization may presumably be deemed almost negligible. Any allowance in this regard will, however, be in favour of the company. Perhaps such allowance would bring the total profit accruing to the company up to about 6s. per ton milled, or a rate of earning approximately equivalent to the earnings of the Aurora West and Langlaagte Estate after allowance for the ordinary 10 per cent. profits tax in respect of these two latter companies. It is important to note that the Modderfontein Government Areas is exempt from the Profits Tax (Gold Mines) Proclamation of 1902, so that the profit of 6s. per ton is subject to no further deductions assuming that 18s. covers all working expenditure and that no amounts have to be deducted on account of capital expenditure or interest on loans and debentures. It has, however, been announced as the intention of the company at a future date or dates to considerably extend the equipment. In what manner the money necessary for such extension will be found cannot at this date be predicted. Whether a certain proportion of profits earned with the 100-stamp plant now nearing completion will be set aside for further extension of the mill, or whether the sum required will be raised *en bloc* in the form of a loan or debenture issue is so conjectural a matter that it is not proposed to discuss this aspect of the finance of the Government Areas Company at the present.

Question of Dividend.

It should, however, be of interest to note that at the annual meeting held in May last the Chairman stated that the company's contract with the Government enabled it to raise money by borrowing, or by creating a debenture issue. "It was too soon to state how the company would be financed. As they would see from the balance sheet there was a substantial amount of money, and they did not anticipate that there would be any considerable shortfall, but the bigger scheme would be taken in hand if the development continued to disclose such satisfactory results as they had been getting during the last few months, and when the bigger scheme was taken in hand no doubt the financial scheme would be formulated and put before the shareholders. At the present moment it was difficult to say when the dividend stage would be entered on." The outstanding fact deduced from the foregoing calculations is that the company's profit after a few months' running and provided there is no serious shortage of labour or falling off in stope face values is likely to be about 6s. per ton. On 50,000 tons per month this would amount to £180,000 per annum, or roughly 12½ per cent. of the capital of the company—£1,400,000.

A Premium on the Small Mill.

A somewhat remarkable feature of the double taxation scheme formulated by the principals of the company and accepted by the Government is that from the point of view of the company there is apparently no inducement to increase profits per ton so that they exceed more than about one-third of the revenue. We dealt with this aspect of the Modder Government Leases taxation scheme some time ago, but at that time were under the disability of not possessing concrete figures as to probable revenue and expenditure. That disability is now largely removed by the prosecution of development to such a degree that data as to probable recovery value are available, whilst at the same time the operations of surrounding mines enable one to strike a rough average as to probable working expenditure. Reverting again to the basis of these calculations—a yield of 28s. per ton milled. It has been shown that with costs at 18s. per ton the Government secures 4·194s. and the company 5·806s. of the 10s. gross profit. Supposing costs were reduced to 14s. per ton, seemingly a by no means impossible figure for such a huge venture. The Government's share of the 14s. gross profit would then be 7s. + 1·575s., or 8·575s. in all, leaving 5·425s. for shareholders, or ·381s. less than if the gross profit were 10s. per ton. In other words, by reducing expenses by 4s. per ton, the management would be losing 4d. per ton to the company and at the same time, since reduction would doubtless be brought about by extension of plant, the exhaustion of the claims would be accelerated and the capital account augmented. But it should be remembered that the calculations advanced in the foregoing are based on the unit of a ton milled only. Obviously, although the incidence of taxation might result in a lesser profit per ton if the equipment were doubled and the costs reduced, the earnings on a basis of 100,000 tons per month would be much greater than on a basis of 50,000 tons per month, provided there was no serious decline in the recovery value per ton. The distribution of profits on larger capital and the consequent shortening of the life of the mine by reason of the accelerated exhaustion of the property are matters which are rather outside the scope of the present article, in which a discussion of the outlook for the near future only of this huge property is attempted. This much can, however, at this juncture be stated with every confidence, that the Modder Government Areas will very shortly enter upon an era of prosperity in which State and shareholders will alike participate.

The Development of Oil Resources.

A comprehensive survey of the oil-field prospects now attracting attention in various parts of the Empire forms one feature of a remarkable special issue of *The Financier*, recently to hand. One of the points emphasised is the responsibility which rests on the Governments of the various Dominions to do whatever may be in their power to assist in the development of oil resources within their borders, as to which it is remarked that judging from recent happenings in certain of our colonies, individual Governments are not dealing with the problem to the best advantage, though they are given credit for really doing their best. Among other ways in which practical assistance can be rendered, it is pointed out, is the bounty system, which is stated to have been a great success in Canada, in the sense that it has done a great deal to encourage drilling in doubtful districts, thereby increasing the volume of work, and preventing to a great extent the natural decline in the industry, though unfortunately the efforts to enlarge the oilfields of Eastern Canada have been attended in many cases with disappointing results. Mention is also made of what has been done in the same direction by the Governments of Australia and New Zealand. In the case of New Zealand a bounty was offered a year ago not only for oil produced within the Dominion, but also for oil locally refined. South Australia recently offered a bonus of £5,000 to the first individual or company to obtain from a well within that colony 100,000 gallons of crude petroleum, while the Tariff Commission of the Commonwealth has had under consideration a proposal to offer a bounty of 2d. per gallon on crude oil produced from shale. With regard to the latter, stress is laid on the importance of colonial Governments devoting attention to the collection of data as to the prospects from shale formations, and in this connection special reference is made to South Africa. While disappointment is expressed as to the recent report of the oil survey of the Union, in so far as the prospects of obtaining petroleum at first hand are concerned, the report is cited as showing in considerable detail that the industry of mining shale, and extracting and refining oil therefrom, is one which must be regarded as having at all events great possibilities. It is pointed out that owing to the remoteness of South Africa from nearly all sources of oil supply, and the general dearness of freights, a shale oil industry in South Africa could be made successful under conditions which might not be commercially profitable elsewhere. "It should be remembered," remarks the writer, "that although the shale oil industry does not, and never can, produce sensational results, such as drilling for oil produces in the shape of large gushing wells, and the profits earned in shale oil must always be assessed on a moderate basis, yet in some respects shale oil production is a less risky and more steady proposition than oil well drilling. Given a fairly thick seam of oil shale, with a good oil content and a satisfactory supply of by-products, such as sulphate of ammonia, oil-shale mining and refining can in many of our overseas Dominions be made to pay very respectable profits."

At the Government examination held on June 17, 18, and 19, the following Transvaal candidates were successful, all others failing to satisfy the examiners:—Mechanical engineers: H. Dahll, E.R.P. Mines; D. M. Davidson, E.R.P. Mines; G. Farrar, Village M.R.; F. May, Nigel; W. H. Mitchell, Sheba G.M.; and A. M. Thorp, Crown Mines. Electrical engineers: H. Dahll, E.R.P. Mines; F. May, Nigel. The above were all pupils at Mr. Whittome's engineering college.

MANAGER AND STAFF OF THE WEST RAND CONSOLIDATED MINES, LTD.

Second row, sitting (left to right).—W. E. Platt, W. Whyte, J. G. Gubb, S. D. Parsons, C. E. Manners, A. J. Seex, D. T. Morton (Manager), J. K. Digby, N. Morrison, W. Lacey, T. J. Mossop, E. S. Day, G. L. O. Armitage.

Third row.—H. W. Nunneley, D. J. Poole, R. Molyneux, J. H. Sara, A. Anderson, C. P. Watson, C. F. Libbis, D. Edwards, H. Angel, P. G. Watson, F. C. Brown, E. H. Sansom, J. L. Forsyth, C. Spruyt, C. E. Theobald.

Fourth row.—O. W. Penny, J. H. Anderson, S. Harding, R. C. Hall, A. V. Berry, J. M. McNamara, C. Haynes, J. Cock, G. Smith, J. Gold, C. H. Hobson, A. O. Wraith.

Top row.—C. M. Curry, H. Ward, H. C. Johnston, J. C. Oliphant, W. J. Spurr, F. T. Carr, O. V. Pooley, J. M. Maciver, C. Anderson, H. C. Boydell, L. H. A. Diering, W. R. Ranson, E. J. Kaiser.

Bottom row.—M. Kedian, N. de Villiers, G. W. Palmer, G. Melville, P. J. Rosevear, A. Rosiesky, F. E. Beer.

Olliver, Photo.

Henderson's Transvaal Estates.

The report of Henderson's Transvaal Estates, Ltd., for the period from 10th December, 1912, to 31st March, 1914, submitted to the meeting on the 11th instant, states that the issued capital is now 2,801,132 shares of 5s. each, 2,212,685 shares fully paid having been issued in part payment of the assets of Henderson's Transvaal Estates, Ltd. (Rhodesia), and 591,717 shares having been allotted to applicants for cash, 2,016 shares have still to be issued in respect of unconverted fractions of shares. The result of the company's operations to the 31st March shows a net profit amounting to £31,014, after writing off the item "preliminary expenses." The directors have carefully considered the propriety of declaring a dividend, but have reluctantly come to the conclusion that the interests of the company will best be served by refraining from any distribution of cash for the past period. The business in hand, as outlined on the reorganisation of the company, is of an important character, requiring considerable capital, which the circumstances of the finance markets now current make it impossible to rely upon obtaining outside of the company's own resources. The profit of £31,600 earned during the period under review has therefore been carried forward. In terms of the scheme submitted and approved by the shareholders in general meeting, an offer of shares in the proportion of one in respect of every three shares held was made to the shareholders; 591,747 of these shares have been allotted and calls thereon to the extent of 2s. 9d. per share have been made to date. The whole of the company's debenture debt, which at the date of the reorganisation amounted to £62,610, has now been paid off. During the period under review eleven farms belonging to the company and the corporation have been sold, the minerals being reserved in each case where the area justifies it. Most of these sales have been effected under arrangement for deferred payments for periods up to five years, interest running on the outstanding balances. The sales include the Fullerton's Concession in Swaziland, which realised £7,000. It will be seen that there has been a larger demand for land than in any previous period of the history of the company's predecessors. The directors are advised that, although this has been checked for the moment, a revival can confidently be expected. Investigations are being made as to the practicability of several schemes for irrigating portions of the company's farms.

Frank Smith Diamonds.

For the month of June the results were as follows:—15,500 loads treated, yielded 1,650 carats.

STAMP DUTY IN MAY OVER NINE TONS.

Some Remarkable Crushing Statistics—Only Six Mines Now Not Equipped with Tube Mills.

MONTH after month the daily stamp duty of the Witwatersrand increases, and it is important to note that during May for the first time in the history of the Main Reef series an average duty of over nine tons in the twenty-four hours was obtained by each stamp head working on the Witwatersrand. In all 2,196,287 tons were put through batteries comprising 9,220 stamps in an average working period of 26·44 days of 24 hours each. The duty thus works out at 9·01 tons per stamp per diem as compared with 8·97 tons in the previous month. The attainment of a stamp duty of over 9 tons for the first time in the history of the industry is an event which seems to call for some remark. In the first place it should be recorded that the crushing efforts of the 9,220 stamps were aided by 285 tube mills. Without these and the coarse crushing policy which their employment connotes it would not, of course, have been possible to attain to such a high state of crushing efficiency as is reflected in the above figures.

LEADING MILLS.

The highest stamp duties on the Witwatersrand in respect of operations in May were recorded by the two new mills of the Barnato group, the Consolidated Langlaagte and the Van Ryn Deep. At both these reduction plants the proportion of tube mills to stamps is very high, one tube to ten stamps as against one tube to thirty-two stamps, which in that month was the average for the whole Witwatersrand. In the case of the Consolidated Langlaagte 100 stamps and 10 tube mills were employed, and these crushed 51,800 tons of ore in 23 working days, thus giving an average duty per stamp of 22·52 tons. At the Van Ryn Deep 80 stamps were operated in conjunction with 8 tube mills for 21·81 days and 42,080 tons were stamped. The average duty per head per day was accordingly 21·2 tons. The Robinson Deep follows in the duty list with 115 stamps and 9 tube mills, the ore crushed per stamp head in the twenty-four hours being 16·32 tons. Next in point of duty to these companies came the Roodepoort United Main Reef, a property which, by the way, is now doing substantially better than for many months past. Here 55 out of the 100 heavy stamps erected a year or two ago in the new plant were worked together with three tube mills and the duty was 15·6 tons.

OTHER ABOVE AVERAGE DUTIES.

Other mines recording a duty above the average for the Rand were as under:—

Mine.	Stamps.	Tube Mil's.	Duty (Tons).
Geduld Proprietary ...	50	5	14·94
Modder B.	80	5	14·24
Simmer Deep	180	9	13·77
Brakpan	140	9	13·73
Princess Estate ..	60	5	12·94
City Deep	150	9	11·81
Crown Mines . ..	660	24	11·71
West Rand Cons. ...	100	4	10·99
Luipaardsvlei Estate	60	3	9·85
New Modderfontein ...	180	7	9·77
Wolhuter	120	4	9·74
Village Deep	180	7	9·72
Randfontein Central	950	29	9·57
Van Ryn	110	6	9·53
Durban Roodepoort D.	100	3	9·32
Knights Central ..	90	3	9·20
New Kleinfontein .	200	4	9·19
Knights Deep	100	11	9·19

At the other end of the scale we find the old batteries of the May Consolidated and New Rietfontein unequipped with tube mills achieving a duty of 4½ tons, an accomplishment that would have been deemed quite good in the days of the pre-tube mill régime. It is interesting to note that there are now only half a dozen mills along the whole reef which are not equipped with tube mills. The properties which do not possess secondary grinding appliances are the Aurora West, Glencairn, May Consolidated, New Rietfontein, Spes Bona tribute, and Vogelstruis Estates. Of these the highest duty secured was by the Aurora West, 6·38 tons—quite a noteworthy achievement considering the absence of tube mills.

CORRESPONDENCE AND DISCUSSION.

Tin Shareholders' Thanks.

To the Editor, *South African Mining Journal.*

Sir,—On behalf of several shareholders in tin companies, I have been asked to express our gratitude for your lucid articles on the prospects of the metal. Our anxiety, as you can imagine, has been great, but your reviews on the subject have revived our hopes that the recovery of price is only a question of a little time.—Yours, etc.,

E. L. ETHERINGTON.

[illegible], July 7th, 1914.

Leeuwpoort Tin Dressing Plant.

To the Editor, *South African Mining Journal.*

Sir,—Our attention has been called to an article in the *S. A. Mining Journal*, Vol No. XXIII., Part II., No. 1188, dealing with the tin dressing plant in the Transvaal. In this article you intimate that the reduction and concentrating plant for this property was supplied by Messrs. Fraser & Chalmers, and in the list of such plant, you refer to "Buss Tables." These tables were, however, supplied by this firm. You also go on to state that these Buss Tables are a new feature in a tin plant in this country, but this is incorrect, as we have had Buss Tables in use in this country for a large number of years.—Yours, etc.,

STURROCK & CO.

Johannesburg, July 7th, 1914.

The Oil Resources of the Empire.

In a recent lecture before a meeting of the Society of Arts, the subject of the "Oil Resources of the Empire" was dealt with at some length by Dr. Mollwo Perkin, who, in summing up, pointed out that the only present and probable future source of petroleum oil in the United Kingdom is from the shale deposits, the production of which is but a drop in the bucket, while the mineral oil output from our enormous Empire is strikingly small compared with that obtained from the United States and Russia. Great Britain, after India, supplies the largest quantity. At present our eyes are turned to Canada, and if the hopes obtaining in this connection mature, a vast addition will be made to our scanty supplies. The present production of the British Empire may be placed at: India, 1,000,000 tons; Scotland, 275,000 tons; Canada, 32,000 tons; Trinidad, 34,773 tons; New South Wales, 7,458 tons; other sources (say), 10,000 tons; total, 1,359,231 tons. Dr. Perkin added that in Great Britain about 1,325,000 tons of tar are annually produced by the destructive distillation of coal, obtained from the following sources: On 15 million tons of coal in gasworks yielding 4·5 per cent. of tar, 700,000 tons; on 8·5 million tons of coal in coke ovens yielding 5 per cent. of tar, 425,000 tons; from blast furnaces, 200,000 tons; total, 1,325,000 tons. This amount, of course, would be largely increased if all the coke ovens were fitted with by product recovery plant.

THE POSITION OF THE MESSINA DEVELOPMENT CO., LTD.

Finances Affected by Late Failures—Details of Loans of £183,000 to Canadian Agency.

THE Messina (Transvaal) Development Company, Ltd., of which Mr. Arthur M. Grenfell was until lately Chairman, announces that its finances have been affected by the recent failures of Chaplin, Milne, Grenfell & Company and the Canadian Agency. Mr. J. S. P. Samborne, who was Managing Director of the Agency, and Mr. Arthur M. Grenfell have, as previously announced, resigned their seats on the Board of the Messina Company, and Mr. C. F. H. Leslie and Mr. H. C. Hoover have been elected Directors, the former being appointed Chairman. It was consequent on these changes in the Directorate and the failures mentioned that Messrs. Price, Waterhouse & Company were asked to report on the London accounts of the Messina Company. Their report will be found below, and a perusal reveals the serious extent to which the company is involved. The directors announce that they on Tuesday last completed such arrangements with their bankers, the National Bank of South Africa, as will enable them to meet the company's present financial requirements. In the course of a circular addressed to the shareholders the directors of the Messina Company state that the undertaking is earning net profits at the rate of not less than £100,000 per annum, and recent developments have been of a favourable character. Further investigation of the company's affairs is to proceed and subsequently the directors will make such recommendations to the shareholders as they think necessary for strengthening the financial resources of the company and for the further development of the property.

AUDITORS' REPORT.

The following is the report by Messrs. Price, Waterhouse & Co., dated 16th ultimo, referred to above:—"In accordance with your instructions, we have attended at your company's office and have examined the books kept in London, and have prepared therefrom as at 9th June last a statement of the liabilities of the company in London, the loans due to the company, and the cash at that date, which we set out below. We have not included in the liabilities any amount for directors' fees and office administration, or for mining engineers' or Mr. Frecheville's special fees.

Liabilities.

Bills payable, due 16th June, 1914			£6,000
Bill accepted by Chaplin, Milne, Grenfell & Co., and discounted by the Messina (Transvaal) Development Company			6,000
Acceptances by the Canadian Agency, discounted by the Messina (Transvaal) Development Company and payable to the holders: £10,000 due 11th June, £10,000 due 20th June, £14,000 due 29th June, £15.000 due 1st August, £10,000 due 6th August			59,000
Acceptances:			
Against copper shipments	£96,000		
Less—Remitted on account	39,000		
		£57,000	
Remittances on account of copper shipments		39,000	
			96,000

We are informed that the copper shipments in transit or already delivered have a value of £96,000, which covers the above liability.

Interest on debenture stock £5,620

Assets.

Loans to the Canadian Agency £183.000

Against securities as follows:—4,200 shares Camp Bird; 33.200 shares Emba Caspian Oil Company; 6 000 shares Edmonton Land Syndicate; 2,694 shares Santa Gertrudis Company; £770 5 per cent. debentures, South Winnipeg; 105.000 shares South Winnipeg; £34.500 5 per cent. debentures St. Petersburg Land and Mortgage Company; 2.000 shares British Foreign and Colonial Corporation; 15,500 shares Alberta Land Company; 3,000 shares Southern Alberta Land Company; £150,000 debentures Canadian Agency; charge on certain contemplated business. We have verified the above securities with the exception of: 2.000 shares Santa Gertrudis Company; £18,000 5 per cent. debentures St. Petersburg Land and Mortgage Company, which your company's secretary informs us are in the hands of Messrs. Chaplin Milne Grenfell & Co. for the account of your company.

Chaplin, Milne, Grenfell & Co.—

Cash on current account	£14.930
Bills receivable	8,500
Cash with bankers	3.792

It should, of course, be clear that the foregoing has nothing to do with the mine of the company in the Northern Transvaal, which, we understand continues to open up in an eminently satisfactory manner.

RESUSCITATION FROM ELECTRIC SHOCK.

A year or two ago the National Electric Light Association of the United States appointed a Commission to report on Resuscitation from Electric Shock. This Commission was a representative one, embracing as it did Dr. W. B. Cannon as chairman, Professor Elihu Thomson, Mr. A. E. Kennelly and others. The report of the Commission is an important document and is partly devoted to a consideration of the Schäfer and Sylvester methods of artificial respiration and partly to mechanical devices for artificial respiration. Amongst these devices the Pulmotor comes in for a considerable share of attention, and in some cases the comment is not altogether favourable. It is unfortunate, however, that the Sub-Committee formed to test the action of the devices under consideration included Dr. Meltzer as chairman, who was also a member of the main Commission, in view of the fact that the Commission recommend Dr. Meltzer's mechanical method of artificial respiration. In these circumstances, it is rather difficult to see why Dr. Meltzer remained a member of the Sub-Committee or the Commission. In this country it would have been considered proper that any interested person should resign and allow their colleagues to pass the report. Too much weight must, therefore, not be placed upon the report of the Committee, but in view of the fact that they deal with and to some extent add fresh information to our knowledge of a subject wihch has excited considerable attention during recent years, we publish the following extracts from the Commission's report:—

An electric current may kill either by temporarily paralysing the nervous control of the muscles of respiration, or by stopping the regular beat of the heart. When the heart is seriously affected it ceases to contract as a whole, but continues to contract in parts here and there, so that it appears to quiver. It is then said to "fibrillate." In this condition the heart fails to keep the blood circulating and death quickly results. At present no practical procedure has been discovered which will restore the regular beat of the heart in man after it begins fibrillating. Hope of resuscitation is now restricted to proper treatment of the cases of paralysed respiration; and since deprivation of oxygen for about ten minutes injures irremediably some of the nerve centres of the brain, it is particularly important that measures for resuscitation be applied immediately and continued until natural breathing returns. In some instances, however, the heart may be merely weakened without being made to fibrillate; in such cases artificial respiration may be of vital importance, because a greatly weakened heart leads to impairment or total stoppage of respiration, which in turn destroys the last vestige of the heart-beat. In all cases, therefore, an attempt should be made to restore natural breathing. The Commission was confronted with three problems: (1) The determination of the best manual method of artificial respiration that can be instantly applied by laymen, and the clear description of that method; (2) a consideration of special mechanical appliances for continuing artificial respiration, and the possible invention of a simple and effective arrangement, the action of which might be quickly and easily learned; (3) an investigation of the possibilities of restoring the fibrillating heart to its natural pulsation. The third of these problems has not been solved. The advantages claimed for the Schafer method over the Sylvester method are: (1) Greater simplicity and ease of performance; (2) absence of trouble from the tongue falling back and blocking the air passages; (3) little danger of injuring the liver or breaking the ribs if pressure is gradually and not violently applied; and (4) larger ventilation of the lungs. There is no question regarding the first three of these claims. The claims for larger ventilation Professor Schafer supported by experimenting on conscious human subjects. He compared the volumes of air taken into and expelled from the lungs by the prone pressure method and by the other manual procedures of artificial respiration. His results showed a to-and fro tide of air sufficient to maintain life indefinitely when the prone pressure method was used, but a volume considerably less than normal when the Sylvester and other methods were employed.

Mortality of Mine Employees.

The quarterly mortality return of mine employees in the Union, covering the period ended the 31st of March, shows that the Provincial Council rates per thousand per annum were as follows: Cape, 23·648 (diseases 29·971, mining accidents 1·006); Natal, 15·630 (diseases 12·969, mining accidents 1·995); Transvaal 20·125 (diseases 15·943, mining accidents 3·467); Orange Free State 21·545 (diseases 20·607, mining accidents 0·625). Homicide and suicide accounted for eleven white and nineteen coloured deaths in the Transvaal, one white and two coloured in Natal, one white and one coloured in the Cape, one coloured in Natal, and one white and one coloured in the Free State.

THE JUNE OUTPUT: GROUP RETURNS.

Excellent Returns for a Short Month.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of June:—

Company	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	61,500	17 2	18,179	£24,217
Geldenhuis Deep	300	7	52,000	22 1	16,951	13,862
Nourse Mines	260	7	51,400	19 1	16,566	20,612
Ferreira Deep	280	7	61,400	16 9	25,199	54,470
Crown Mines	660	26	205,000	15 2	62,934	108,045
Durban Roodepoort Deep	100	3	26,420	24 0	9,411	7,851
Totals & averages	1900	57	458,720	17 4	149,243	£229,090

The following are the results of crushing operations of Central Mining companies for the month of June:—

Company	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B	80	5	34,200	15 10	14,880	£35,433
New Modder	180	7	51,500	15 1	23,071	58,291
City Deep	150	9	41,200	22 5	19,508	35,558
Village Deep	180	7	51,800	16 10	17,755	30,996
Village Main Reef	160	6	32,300	17 5	13,915	30,223
Robinson	250	6	51,400	14 11	19,655	41,301
Bantjes Cons.	100	3	22,000	21 4	6,754	4,915
Totals & averages	1100	43	284,400	17 3	115,568	£239,717

Barnato Group.

The following are the operations of the Barnato Group for the month of June:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.
Cons. Langlaagte	100	52,700	£66,938
Ginsberg	75	14,932	16,756
Glencairn	160	20,925	15,750
New Primrose	155	23,300	27,113
New Rietfontein	55	6,959	7,188
New Unified	60	12,910	14,454
Queen	35	1,513	2,867
Van Ryn Deep	80	42,620	70,586
Witwatersrand	210	44,820	50,910
June totals	930	220,679	£272,562
May totals	930	220,701	£268,652

Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Cons. Langlaagte	£39,587	15 023	£27,807
Ginsberg	13,571	18 177	3,334
Glencairn	12,938	12 366	2,969
New Primrose	14,971	12·850	12,440
New Rietfontein	6,574	18 894	864
New Unified	9,339	11 468	5 250
Queen	2,476	10 972	557
Van Ryn Deep	34,658	16·264	36,662
Witwatersrand	27,600	13 200	25,347
June totals	161,714	14 656	£115,230
May totals	162,661	14·740	£110,139

Monthly gross profits, January, £87,277; February, £94,055; March, £104,704; April, £104,498; May £110,139; June £115,230.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of June, 1914, of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	53,500	14,504	£24,862
Robinson Deep ...	130	10	50,330	16,368	28,378
Knights Deep ...	400	11	95,100	17,137	12,445
Simmer Deep ...	180	9	49,100	10,158	4,603
Sub Nigel	25	1	1,700	2,147	1,561
Totals	1055	38	253,030	60,314	£71,849

Total gold in reserve:—Simmer and Jack, 500 ozs.; Robinson Deep, 2,366 ozs.; Simmer Deep, 1,832 ozs.; Sub Nigel, 780 ozs.; total, 5,478 ozs.

The sundry revenue included in the above total declared profit is as under:—Simmer and Jack, £2,500; Robinson Deep, £391; Knights Deep, £356; Simmer Deep, £551; Sub Nigel, £233; total, £4,031.

Note.—Knights Deep: Reduced output due to loss of time occasioned by accident to water column, since repaired.

Albu Group.

The following are the details of results regarding the June operations of the producing mines of the General Mining and Finance Corporation Group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,540	£13,640
Meyer and Charlton	75	14,700	12,688
New Goch	120	29,200	20,682
Roodepoort United	70	30,012	25,595
Van Ryn	140	38,200	29,604
West Rand Consolidated ...	100	26,300	26,102
	585	152,952	£128,311

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	18 9·1	£17,726	£4,086
Meyer and Charlton	17 3·2	35,576	22,888
New Goch	14 1·9	31,371	10,689
Roodepoort United	17 0·7	28,626	3,031
Van Ryn	15 5·9	50,853	21,249
West Rand Consolidated ...	19 10·2	31,795	5,693
		£195,947	£67,636

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of June, 1914:—

Company	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ..	100	—	14,000	£9,680	£535
Princess Estate	60	5	21,300	27,747	2,320
Geduld Proprietary ..	50	5	19,130	30,509	8,181
	210	10	54,730	£67,936	£11,036

Nigel G.M. Co.

The returns from this company's mine for the month of June are as follows:—Gold, 4,180 fine ozs.; profit, £2,388; stamps working, 75; tons milled, 11,000; value of gold, £17,756. Portion of plant stopped for repairs during month. Still without rain.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	44,680	£56,038	£21,222
Wolhuter	32,700	41,031	14,000
*Consolidated Main Reef..	24,110	38,370	13,934
*Main Reef West	19,750	26,037	5,055
Knight Central	21,150	22,620	603
Total for Group ...		£184,096	£54,814

*In addition to the profit for June, earned by the Consolidated Main Reef Mines and Estate, Ltd., and the Main Reef West, Ltd., gold to the value of £3,666 and £5,873, respectively, was obtained from the final clean-up of certain plates which will not be required in the new tube mill plate house, to which a portion of the battery plates has been transferred. These amounts of £3,666 and £5,873 have been treated as special declarations.

Brakpan Mines.

The following information is officially supplied in respect to the June, 1914, output:—Stamps working, 140; running time, 29 days; ore crushed, 54,150 tons; tube mills working, 9; ore hoisted, 61,912 tons; ore from dump, 2,000 tons; waste sorted, 13·33 per cent.; fine gold declared, 17,640 ozs.; value declared, £74,299, equal to 27s. 5d. per ton milled; working costs, £48,609, equal to 17s. 11d. per ton milled; working profit, £25,690, equal to 9s. 6d. per ton milled.

Springs Mines.

Development work:—North and south shafts: Total footage, 4,261; footage on reef, 2,369; footage sampled, 2,776; reef width, 15·37 inches; assay value, 21·247 dwts. Of the footage sampled during the quarter, 59 per cent. was in payable areas and averaged 27·9 dwts. over 18 inches. A similar analysis of the total development to date shows 51 per cent. of payable footage, averaging 18 dwts. over 25 inches. The Rand Water Board took 82,691,000 gallons of water during the quarter.

RAND WATER BOARD ANNUAL REPORT.

Particulars of Water Supply and Consumption in the Year—The New Vaal River Scheme.

THE annual report of the Rand Water Board for the year ended March 31, 1914, makes a timely appearance this week. The report is as informative and exhaustive as ever and contains a wealth of details bearing on the water supply of the Rand. *Inter alia*, it says:—

Although the year under review cannot be considered a dry period, the measured rainfall at Johannesburg being only 2·57 inches below the average of 31·28 inches for the past twenty-five years, the incidence of the rainfall was unsatisfactory from a water engineering point of view. Reference is made to this in the attached report by the Chief Engineer. It appears that generally the falls consisted of light showers of short duration, which gave a much lower run off than usually accompanies a more intensive rainfall. In so far as the Board is concerned the effect produced by these conditions was twofold: its dolomite sources at Zwartkopjes and in the Springs district were not adequately replenished by surface percolation; and there was an increased demand upon the Board by the mining companies, owing to the comparatively low levels of their dams and reservoirs. As has been stated more than once in previous reports by the Board, whenever the rainfall conditions are unfavourable, the supply from the Board's underground sources at Zwartkopjes falls away considerably, while almost simultaneously the demands of consumers increase. In April, 1913, the total quantity available for distribution was about nine million gallons a day. This was increased to over ten million gallons in July following, owing to the additional quantity then obtained from the Zwartkopjes district. The largest quantity pumped and sold was in December last, the figures being, respectively, 11·3 and 10·56 million gallons a day, averaged over the month. From that time until the end of the financial year, the quantity available gradually decreased to 9·13 million gallons daily owing to the falling off in the yield of the Zwartkopjes wells. On many occasions the actual consumption exceeded the supply, the excess having been drawn, at such times, from the Board's storage works and from the reservoirs of the Johannesburg Municipality. Since the month of December the Board was obliged to place restrictions on the draw off by all its consumers, especially by mining consumers, and these restrictions must of necessity remain in force until the next summer rains relieve the pressure of the demand to some extent. The particulars contained in "Appendix 3" show the quantities supplied monthly to the various consumers during the period under review, as well as the total annual quantities supplied during each of the preceding eight years. In "Appendix 4" is set out the average daily quantities sold half yearly to the municipalities, the mines, the Railway Administration, and other sundry consumers, since the 1st April, 1905, when the Board first undertook the supply of water on the Witwatersrand. It will be observed from the comparative figures contained in these appendices, that more water was distributed by the Board during the year 1913-14 than in any previous period. They also give some indication of the fluctuation which usually occurs in the demands of consumers, but that fluctuation, as shown by the figures for the past three years, is small in comparison with that which would appear if the Board had had sufficient water available at all times to satisfy the requirements of its consumers. Although occasional shortages of supply occurred from September last until the close of the financial year, they were not so serious in their effect, and apparently did not occasion such inconvenience to consumers as those experienced during the previous three years. The explanation of this is to be found in the fact that, as the figures referred to above show, the available supply was greater, and more nearly approached the demand, than during the preceding triennial period. The development work at Zuurbekom increased the supply from that station from a maximum of 2·85 million gallons in August, 1912, to 6·4 million gallons a day at the end of March last, and when the additional pumping machinery, now on order, is installed, it is expected that a further increase will result. On the other hand the yield from the Zwartkopjes sources has fallen from 4·4 million gallons at the end of November, 1913, to about 2 million gallons at the end of the period covered by this review, and no recovery is expected until the underground channels and fissures are replenished by steady rains. In the Springs district there has also been a falling off in the quantity obtainable from the shafts of the three mining companies which the Board has connected with its distribution system with the permission of the Union Government.

TEMPORARY SOURCES OF SUPPLY.

About the middle of 1913 negotiations were opened with the owners of the non-dolomitic farm Roodepoort, in the Klip River district, for obtaining a combined surface and underground supply of about one million gallons a day, for a period of from five to seven years. Finally the Board decided to adopt this temporary scheme, the cost of which is estimated at £36,000. The erection of the dam on the farm and the laying of the pipe line to connect it with the Zwartkopjes system, were well advanced at the close of the year; the whole work will, it is expected, be completed early in July next. As explained in the Chief Engineer's report, a first instalment of 500,000 gallons a day will then be obtainable from the springs and boreholes on the property, but the second or catchment portion will not be available until the reservoir is filled by the rains of the next summer season. This source and those at Springs will not be utilised by the Board after the proposed Vaal River scheme has been completed. Towards the close of the year the Board was considering the necessity of obtaining further temporary supplies, so as to prevent, as far as possible, a recurrence of the shortages which caused so much loss and inconvenience to the Board and its consumers during the past four years. The possibility of obtaining such further supplies at a reasonable cost and with the sanction of Government, is still under consideration. With such further addition, the Board is of opinion that it will be able to keep pace with the demands of its consumers during the next four years, when, it is probable, a permanent supply of 10 million gallons a day from the Vaal River will be in service. The total capital expended by the Board in the development of temporary sources during the past three years amounted to £81,862 at the 31st March last, the further actual commitments at that date being, approximately, £15,2[illegible]0. Out of that total amount of £97,062 a sum of £49,300 will be provided out of water sales revenue over a period of about five years, to cover the loss on depreciation when the machinery installed is dismantled, and the various temporary pipe lines are removed. It will be possible to utilise the whole or the greater portion of the materials from these pipe lines in the extensions and alterations of the distribution systems on the Rand, which will be necessary in connection with the new Vaal River scheme.

Roberts Victor Diamonds.

The following are the results of operations of this mine for the month of June, 1914:—Washed 16,386 loads, yielding 3,331¼ carats."

GROUP PROFITS IN JUNE.

Favourable Comparison with May—Some Noteworthy Improvements.

DESPITE the lesser running time the profits of the mines comprising the various groups of companies operating on the Witwatersrand earned during last month compare very favourably with the profits secured in May. Considering first of all the two leading groups of the Rand, the Central Mining and Investment and the Rand Mines, Ltd., both under Corner House control, it is to be observed that the aggregate profits were in each instance only a little below the May earnings, the comparisons for the two months being:—

	May.	June.
Central Mining	£240,581	£239,717
Rand Mines	231,378	229,090
Total	£471,959	£468,807

The decline is thus only £3,000, which would be more than accounted for at the rate of earning disclosed by the loss of half a day only in running time. In regard to the Central Mining companies, it is important to note that the New Modderfontein June profit at £58,291 is nearly £10,000 better than the May result, whilst the Robinson shows declining by a nearly corresponding amount. Working costs at the City Deep were reduced by 3d. per ton during the month. Of the Rand Mines group the Geldenhuis Deep, Nourse Mines and Durban Roodepoort Deep show the largest advances but the Ferreira Deep's earnings was £5,500 less and that of the Crown Mines £108,015 as contrasted with £111,113 in the previous month.

BARNATO MINES.

Next to the Corner House the Johannesburg Consolidated Investment Company now easily takes second place in the list of group profits. The subsidiaries embraced by this important corporation have continued their progressive increases in profit, the June earnings being the highest as yet recorded. The Van Ryn Deep further improved its profit to £26,062, and the Consolidated Langlaagte with £27,807 is nearly £3,000 better. The New Primrose improved by £1,000. We understand that the Barnato mines will record a further advance in respect of the current month's operations and here record in tabular form the monthly gross profits earned since the commencement of the current year:

January	£87,277
February	91,055
March	104,701
April	104,493
May	110,139
June	115,230

BRAKPAN, E.R.P.M. AND GOLD FIELDS.

Brakpan Mines milled 51,150 as compared with 52,070 tons in May, and the profit advanced from £23,181 to £25,690. At the East Rand Proprietary 161,500 tons were milled, and the profit for the month was £73,892, including £6,270 profit from treatment of the accumulated slime. For May the company declared to the Chamber of Mines a profit of £63,187 and sundry revenue amounting to £6,760. The Consolidated Gold Fields group declare a profit for five subsidiaries of £71,849 as against £70,736 in May. The Robinson Deep's earning was £3,000 better, but at the Knights Deep owing to an accident to a water column the profit of £12,445 was roughly £2,500 less. Monthly profits for the group since the beginning of the year have been:—

January	£80,124
February	73,453
March	68,398
April	64,690
May	70,736
June	71,849

NEUMANN, ALBU AND GOERZ.

Neumann companies show an advance of £2,563. The Knight Central profit of only £603 is very disappointing, but both the Consolidated Main Reef and Main Reef West record substantial gains, the former's profit advancing to £13,934 and that of the latter to £5,055. In connection with these two companies it should be noted that in addition to the profit for June, earned by the Consolidated Main Reef Mines and Estate, Ltd., and the Main Reef West, Ltd., gold to the value of £3,666 and £5,873 respectively was obtained from the final clean-up of certain plates which are not required in the new tube mill house, to which a portion of the battery has been transferred. These amounts of £3,666 and £5,873 have been treated as special declarations. The monthly profits this year have been:—

January	£53,601
February	46,160
March	50,738
April	52,427
May	52,251
June	54,814

The six producers of the Albu group show a small aggregate decline from £68,785 to £67,636. The Meyer and Charlton shows a little further advance to £22,888. The New Goch's costs have been reduced to just over 14s. per ton, and the profit last month at £10,689 was just £4 better than in May. It is gratifying to note that the Roodepoort United, which has for so long been in the doldrums more than doubled its earnings, the June profit being £3,031 and that of May £1,304. The Goerz group earned £11,036 as compared with £10,894 in the preceding month. The Geduld Proprietary earned £8,181 last month and £8,151 in May.

The Sheba.

The following are the results of operations of the Sheba Mine for the month of June, 1914:—"Crushings for the month, 6,520 tons yielded 3,285 ozs. Estimated profit, £4,003."

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of June, 1914:—Tons crushed, 4,025, yielding 2,091 fine ozs.; estimated value of month's output, £8,893, estimated profit for month, £1,977.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of June, 1914:—Central Mines: Tons crushed, 12,350, yielding 8,836·533 fine ozs. Elandsdrift Mine: Tons crushed, 660, yielding 698·850 fine ozs. Vaalhock Mine: Tons crushed, 1,480, yielding 690·424 fine ozs. Estimated value of output, £42,904; estimated profit for month, £25,976.

Luipaardsvlei Estate: Excellent June Returns.

The following is the result of operations for the month ended 30th June, 1914:—60 stamps ran 29·063 days, crushing 17,650 tons, yielding 1,887 ozs. fine gold; three tube mills ran 28·681 days, yielding 892 ozs. fine gold; sands treated, 12,030 tons, yielding 1,313 ozs. fine gold; slimes treated, 5,620 tons, yielding 472 ozs. fine gold; profit from operations, £3,277; sundry revenue, £900; total profit, £4,178; working costs, 18s. 1½d. per ton.

Rhodesian Section.

LATEST MINING NEWS.

The Wanderer (Selukwe)—The R.N.L.B.—Small Workers and the Customs Tariff.

THE manager's summary of April development work at the Wanderer (Selukwe) is: Owing to the seasonable increase in the supply of labour, 608 ft. of development work was accomplished, an increase of 172 ft. over that of the previous month. Of the above footage, 412 was completed in the south section of the Wanderer with poor results apart from the footwall section, which, however, continued to open up satisfactorily. In the Kemerton another small pocket of ore has been opened up. A further small quantity of ore has been developed in the Ashton, so mining in this section may be continued in a few months. May return: Mill ran 17 days; treated by cyanide, 12,276 tons; estimated value of gold recovered, £6,516; total working expenses, including development expenses, £3,617.

* * * *

The third general meeting of the Rhodesia Native Labour Bureau was held a few days ago in the Library Buildings, Bulawayo, the following being present: Messrs. P. B. S. Wrey, George Mitchell, M.L.C., E. A. Begbie, M.L.C. (members of the Board of Management), Messrs. H. A. de Beer, W. Olive, Francis Drake, L. Ludlow, H. P. Holl, E. J. Eardley Mare, Sir Charles Coghlan (Solicitor to the Chamber), and Mr. G. Upton (Secretary). Mr. P. B. S. Wrey, who was voted to the chair in the absence of Mr. G. Wolfe Murray (Chairman and Managing Director), explained that Mr. Wolfe Murray was at Lourenço Marques, where he was engaged in important negotiations with the Portuguese authorities relative to supplies of native labour. Proceeding to deal with some of the salient features in the report of the Board of Management, and accounts, Mr. Wrey said it would be noticed that in October last there was a surplus of native labour amounting to 1,200 boys, but owing to the exertions of the mining members this was duly absorbed. However, as was foreshadowed in the report, it was probable that during this year a further surplus would accrue; he regretted to say that was the case at present, a large number of mine and farm labourers for whom they were unable to find occupation being now in the compound at Salisbury. The importance and seriousness of the position would be fully realised by members. He wished in this connection to draw their attention to, and to ask their cordial co-operation in respect of, the following point: They had between now and December some 9,600 boys due for repatriation. Owing to the very large surplus at the present moment, the Board of Management had determined—wisely determined, he thought—that no further recruiting shall take place for the present in the Northern areas—Northern Rhodesia. Now the position was that they had two thousand boys in the compound at Salisbury. Unless things were going to be very bad in Southern Rhodesia it was hardly possible that the whole of the 9,600 boys due for repatriation before the end of the year would be repatriated: a very large number of these would again be required either by the mines or the farms. It was therefore highly important that the Board and the Managing Director should have the longest notice it was possible to give as to what labour the mines and farms were likely to take in the next six months. Estimating that out of the 9,600 boys at least 5,000 would be required they would see that the position at the present moment, with 2,000 boys in the compound, was a serious one. On the other hand, for financial reasons the Board could not see its way to start recruiting again until it received some information from the members as to their likely requirements between now and Christmas. He would therefore urge every member to give the matter his immediate attention and to notify the Bureau of his probable requirements as speedily as possible. As he had already intimated the Managing Director was at present at Lourenço Marques negotiating with the Portuguese Government with a view to recruiting under the aegis of the Bureau in what was known as the Tete area. The negotiations, if concluded satisfactorily—and they had every hope such would be the case—would mean a most important factor in the future work of the Bureau—and not only to the Bureau but to all employers of labour in this country. They anticipated that a very large number of natives would be recruited from that area; and at the same time on account of the comparatively short distances from which that labour would be drawn the Board had very great hopes indeed that the expense of recruiting, forwarding and repatriating, would be very considerably reduced, and would in time allow of a very material reduction in the cost of labour for both mines and farms.

* * * *

On the morning of the 27th inst., a special meeting of the Rhodesian Small Workers' and Tributors' Association was held at Speck's Hotel, Gatooma, to discuss the Customs Tariff. There was an excellent attendance, amongst those present being Messrs. B. I. Collings, M.L.C., F. Green, J. W. Banner, V. R. Shewell, Capt. Bass, P. S. Triggs, J. Mack, R. H. Ullyett, W. K. Morrison, H. Moser, C. E. Simpson, Dr. Coke, and the Secretary (Mr. E. Seale). By invitation: Mr. A. R. Garrett, President of the Gatooma Chamber of Commerce. Mr. Frank Green was voted to the chair. After the secretary had read the notice convening the meeting, the Chairman invited Mr. B. I. Collings, who had attended specially, to make a statement on the subject of the correspondence with the Controller of Customs anent the alterations that the Union of South Africa contemplated making in the Customs Tariff. Mr. Collings said that he had seen members of the Chambers of Commerce and the Controller of Customs, and they were unanimous in their conclusions that matters cannot go on as they were. Ultimately a sub-committee, consisting of Messrs. F. Green and J. Mack, were appointed, to confer with sub-committees of the local Chamber of Commerce, Hartley, Salisbury Chamber of Commerce, etc., and to report to the ordinary meeting of the Small Workers' Association to be held in Gatooma, on Saturday, 11th inst. Each sub-committee will report to the bodies which they respectively represent.

* * * *

In the House of Commons on Monday, Mr. Harcourt, Secretary of State for the Colonies, in reply to Mr. McCallum Scott, Liberal member for Bridgeton, said the mining revenue of Rhodesia had been for some time divided into "administrative" and "commercial" under an arrangement provisionally accepted by the Imperial Government, which, however, did not exempt the commercial receipts from general liability to make good administrative deficits. He did not understand that the company's claim to the commercial items was based on anything in the Charter, and any question of the company's outstanding whenever the administrative provisions in the Charter were withdrawn would presumably be settled in the Courts.

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THE WEEK IN THE SHAREMARKET.

Stronger and More Active—Rand Stocks Coming Into Their Own—Better Prospects All Round.

There is no longer any doubt about the revival in the market. The week has seen a big increase in business at higher levels, and the whole tone and temper of dealers has undergone a decided improvement. State Mines, Modder Deeps, and practically all the dividend payers have enjoyed an increased demand, and investors on the other side seem at last to be waking up to the lately-neglected potentialities of the Rand. Even tins and diamonds are firmer on the week; and the big economies lately effected on the tin mines coupled with the new diamond agreement have brightened the outlook for both these divisions of the market. With labour coming to the Rand in good quantities, and realization of the fact growing that the mines were never in a sounder position than they are to-day, the outlook for a better market is most promising. In well informed quarters no fear is entertained of a general election to upset business, and the horizon, therefore, seems unclouded.

* * * *

Latest advices from London are to the effect that diamonds have been in good tone, in the expectation that the conference among representatives of leading producers will lead to satisfactory arrangement for regulating output and sales of the stones. De Beers Deferred have been specially well bought. As regards Rhodesians, the notice sent out by the Chartered Company to the effect that the meeting is not likely to be held before November has caused a good deal of criticism. The reason given—namely, that it is inadvisable to invite public discussion of the land question while the whole matter is *sub judice*—may be sound; but surely the directors who control proceedings at the meeting could prevent discussion on that topic, while giving full information on the financial and economic position of the company, which are the matters concerning which the shareholders really desire information. Chartereds on balance are a shade lower, but business in them at the moment is little more than nominal. Shamvas were offered on a cablegram from the mine giving preliminary figures regarding the output of the new plant, but the disappointment expressed seems to be unreasonable, as the plant is accomplishing all that could be expected of it at this early stage. A normal output is expected for the current month, and, in the meantime, good developments are being made on the No. 1 level. Cam and Motors came in for some notice on a report that better extraction is now being obtained, some 70 per cent. of the gold contents being retained on the plates, as against [illegible] per cent. in May.

* * * *

	Fri., 3rd.	Sat., 4th.	Mon., 6th.	Tues. 7th.	Wed., 8th.	Thurs., 9th.
[illegible]	—	[illegible] 5*	[illegible] 5*	—	[illegible] 5	[illegible]
[illegible] Farms	[illegible] 2*	[illegible] 4	[illegible] 9	11 3*	11 [illegible]	11 5
[illegible]	—	16 [illegible]	17 [illegible]	17 9	17 [illegible]	17 [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	—	[illegible]	[illegible]
[illegible]	[illegible]	12 [illegible]	13 6*	[illegible]	[illegible]	—
[illegible]	—	—	—	[illegible]	[illegible]	—
[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] Collieries	—	[illegible]	2[illegible]	[illegible]	21 [illegible]	[illegible]
[illegible]	—	[illegible]	—	—	[illegible]	[illegible]
[illegible] Tins		[illegible]	—	[illegible]	[illegible]	
[illegible]	—	—	—	[illegible]	—	—
City and Suburban	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
City Deeps	[illegible]	63 [illegible]	[illegible]	[illegible]	[illegible]	61 3
[illegible] Mines	4 2*	4 3*	4 [illegible]	4 6*	4 [illegible]	4 [illegible]
[illegible] Collieries	—	—	—		[illegible]	[illegible]
Cons. Langlaagte	32 [illegible]	32 [illegible]	—	[illegible]	—	32 [illegible]
Cons. Main Reefs	[illegible] 9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cons. Mines Selection	—	—	7 [illegible]	7 [illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible] 4*	—	[illegible]	[illegible]
[illegible]	—	3 [illegible]	[illegible]	[illegible]		
Crown Diamonds	—					[illegible]
Durban Roodepoort Deeps	—	17 [illegible]	17 [illegible]	17 3*	[illegible]	—
East Rand [illegible]	[illegible]	[illegible]	2 2	2 3	2 2*	2 [illegible]
East Rand [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
East Rand [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 [illegible]	[illegible]

*Buyers. †Sellers.

	Fri., 3rd.	Sat., 4th.	Mon., 6th.	Tues. 7th.	Wed., 8th.	Thurs., 9th.
East Rand Mining Estates	—	—	3 0*	—	—	—
East Rand Props.	32 0*	32 3	—	32 0*	33 0*	34 6
East Rand Debentures	—	—	—	—	£86½	—
Eastern Gold Mines	1 0*	1 0*	1 0*	1 1*	1 1*	1 2*
Frank Smith Diamonds	2 6	2 9	2 7*	2 9*	3 0*	3 2
Geduld Props.	24 0*	24 0	24 6	24 9*	25 9*	25 9
Glencairns	—		—	—	2 6*	2 0*
Glencoe Collieries	—	6 6*	—	6 3*	6 3*	6 3*
Glynn's Lydenburgs	10 0	10 0	10 6*	—	11 3*	11 6
Goerz and Co.	—	8 9		9 6*	10 0*	—
Government Areas	23 3	23 6	23 6	23 9	24 0	24 1½
Jhb. Board of Executors	23 6†	23 6†	23 6†	23 6†	23 6†	22 0
Jumpers	—	4 0†		—	4 0†	—
Jupiters	4 1*	4 3	4 3*	4 6*	5 0*	5 0*
Kaalfontein Diamonds	0 3	0 3*	—	—	0 3*	—
Kleinfontein Estates	20 0†	—	20 0†	20 0†		—
Klerksdorp Props.	2 7	2 7	2 8	2 8*	2 9*	2 9*
Knight Centrals	7 7	7 6	7 9†	7 9	7 7*	7 8*
Knights Deeps			—	—	—	32 0*
Lace Props.	3 1*	3 1*	3 2	3 4*	3 6	3 0*
Luipaardsvlei Estates	10 9	11 0	11 3	11 3*	11 3*	—
Lydenburg Farms	3 0	3 0*	3 0*	3 0*	3 0*	3 0
Main Reef Wests	7 0*	7 4*	8 0*	8 3*	8 0*	7 7*
Main Reef West Debs.	—	—	—	—	—	£72½*
Meyer and Charltons	110 0	110 0	110 0*	110 0*	111 3*	113 0*
Middelvlei Estates	1 6†	1 3*	1 3	—	1 4*	1 4*
Modderfontein B.		—	84 0*	84 0*	85 3*	86 0*
Modderfontein Deeps	55 0	56 6*	57 3	58 3*	57 6*	57 6*
Natal Navigation Colls.	—	15 0*	15 0*	15 0*	—	—
National Banks	240 0*	240 0*	250 0*	—	—	—
New Boksburgs	0 10*	—	—	0 11*	0 10*	—
New Eland Diamonds	—	30 0†	25 0†	—	21 6	—
New Era Cons.	—	5 6	6 0*	6 0*	6 1	6 0*
New Geduld Deeps	1 7	1 8	1 8*	1 8*	2 1	2 1*
New Gochs	16 0	16 0	16 0*	16 0*	16 0*	16 3*
New Heriots		—	60 0	—	58 9*	—
New Kleinfonteins	22 6	23 6	21 3	24 0*	21 6	21 6
New Rietfonteins		3 0	3 0*	—	3 1*	3 6
New Unifieds	—	—	—	—	16 0*	—
Orange Diamonds	—	—	—	—	1 0*	1 0*
Piggs Peak	10 9*	9 9	—	—	9 9*	—
Premier Deferreds (5s.)	—	—	—	150 0*	—	—
Princess Estates	5 3	5 6	5 6*	6 0	5 9*	5 6*
Rand Collieries	2 0*	2 6	2 6	2 6	2 9*	—
Rand Klips	2 4*	2 4	2 7	3 0	3 3	3 1*
Rand Nucleus	1 8	1 8*	1 9*	1 11	1 10*	1 10*
Randfontein Deeps	3 8	3 8*	3 9*	—	3 11*	4 0*
Randfontein Estates	—	—	20 0	21 0	21 9	21 9
Roberts Victors	15 0*	—		—		—
Robinson Deeps	32 6†	32 6†	32 6†	—	29 6*	29 0*
Rooiberg Minerals		20 0*	20 3*	22 0*	22 9†	
Roodepoort Uniteds	7 0*	—		—	—	8 0†
Ryan Nigels	2 8*	2 8*	2 8	—	3 0*	3 1*
Sheba		—		4 6	4 6*	—
Simmer Deeps	1 1*	1 1*	1 3*	1 8*	1 9	1 8*
S.A. Lands	2 7*	2 6*	2 9	2 11*	3 0	3 0*
Springs Mines	11 6*	12 6*	13 6	13 3	13 3	13 6*
Sub Nigels	10 9	10 6*	11 0*	11 0*	10 6*	10 6*
Swaziland Tins	—	—	—	27 6†	27 6†	27 6†
Transvaal Coal Trust	29 0*	29 3*	29 6*	30 6*	31 6	31 9
Transvaal Cons. Lands	—	—	17 6	18 9*	19 0*	19 0*
Transvaal G.M. Estates	37 0	37 0*	—	39 6*	40 6*	—
Tudors	2 0†			—	2 0†	—
Van Ryn Deeps	44 3*	44 9	44 9*	45 0*	45 6*	45 3*
Village Deeps	37 6*	37 9	38 0*	38 9*	38 6*	38 6*
Village Main Reefs	32 0	32 0	32 6*	—	—	32 6*
Vogelstruis Cons. Deeps	—			—	0 9*	1 0†
West Rand Cons.	8 6	8 6	8 6	—	8 6*	8 6*
Witbank Collieries	45 0*			—	—	42 6*
Witwatersrands	—	65 6*	66 0	66 0*	—	66 0*
Witwatersrand Deeps	46 0*	46 0†	45 0*	44 0*	45 0	45 0*
Wolhuters	14 1*	14 3	14 6	14 6*	14 9*	15 3
Zaaiplaats Tins	24 3	24 0	24 6*	26 9	26 3*	25 6*

*Buyers. †Sellers.

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Engineering Notes and News.

A Short Tube Mill of Large Diameter.

In accordance with the present-day tendency to modify the tube mills in use, both in manufacture and in practice, it is interesting to note a mill of large diameter and short length which has been installed by the Butte & Superior Copper Co., Butte, Mont. The mill is 7 ft. in diameter by 10 ft. long over all. The gear is 14 in. wide on the face. The feed scoop is of the three-cup spiral type, so that with the mill operating at 22 r.p.m., it is fed oftener than one each second. The mill is lined with a Forbes type liner redesigned to suit local conditions and will use No. 5 Danish pebbles. The mill has developed an average capacity of approximately 300 dry tons of ore per day, of which quantity approximately 75 tons are returned to the mill as a circulating load. A second mill, almost identical with this one, is now being installed. The type has proven economical and satisfactory.

Mine Signalling Systems.

In his paper on "Mine Signalling Systems," read before the South African Institute of Electrical Engineers, Mr. R. H. Gould said in a mining district such as this, where a large proportion of the engineers were either directly or indirectly connected with the mines, it was surprising to note how little the subject of signalling in the mines had been dealt with in technical papers. Perhaps it was because the importance of the signalling system was not realised to the extent it deserved. The development of railways would have been considerably retarded without the telegraph, and the same would apply to deep level mines if signalling arrangements had not been devised. The method most commonly used for signalling became more general, consisted of a knocker operated by a flexible wire rope, the "knocker-line." As this arrangement could be installed by the miner or timberman, and could be kept in order by them, the mining men here "hung on" to the system as long as possible. It certainly had the advantage of being simple, and, if properly installed, it was reliable within certain limits of length of shafts, and last, but not least, it kept the electrician out of the shaft, which was a consideration. However, since the Mining Regulations required two systems of signalling, one of which could only be operated by an authorised person, mining men had to resort to electrical signalling. In the diagram Mr. Gould showed the system most commonly used on these fields—showing an arrangement for two compartments whereby four wires are required to be led down the shaft. It was now the general practice to use rubbed insulated, lead covered and wire armoured cable for this purpose, with suitable tee boxes at the various stations. With regard to the insulation, he had not heard of any paper-insulated cable being installed for this purpose on the Rand, but provided proper tee boxes and end boxes were installed he did not see any reason why paper cable should not be used.

From an extremely interesting table showing the imports of electrical and similar goods into the Union of South Africa during 1913, published in the *Electrical Review*, we notice that under the heading of mining machinery Great Britain imported goods to the value of £512,000, an increase of £29,000 over the previous year, while the United States is credited with £161,000, or an increase of £33,000 on the preceding year's total. Germany sent £74,000 worth of machinery, being an increase of only £2,000, while all the other countries sent £19,000 worth, showing an increase of £12,000. Thus it appears that British manufacturers have little to fear in the way of competition from Germany, but they should keep their eyes on the United States, which has recently been making strenuous efforts to capture the South African mining orders, and apparently with some success.

Professional Men and the Technical Press.

Engineers and men of technical education and practice generally have a great deal to prevent them from communicating their experience to others. This statement may even be made broader, to include all men of affairs. They become accustomed to depending upon the Press for their information and ideas, but too frequently overlook their duty and opportunity to contribute of their own store of knowledge for the benefit of others. They conduct themselves, one might say, as though the press actually manufactured the material which it publishes, instead of securing it from the public, or some part of the public. In a far-reaching way it is really the duty of the citizen to give some measure of moral and intellectual support to the general press, and of the engineer, as such, to extend professional encouragement to the editors of journals which are published for his class. This is a matter which is not often enough discussed, although *Mining Science* has at times given editorial thought to the matter. In the *Wisconsin Engineer* of the University of Wisconsin for March, the question is dealt with under the title of "The Relation of the Engineering Graduate to Technical Journalism," a paper by E. T. Howson, engineering editor of the *Railway Age Gazette*. What Mr. Howson has observed in this particular field will be found to apply equally to the world of mining. The author divides his subject into three parts: the relationship of the engineer to the journal in his capacity of a reader, in his capacity of a contributor, and in his capacity of an editor. The second of these points is discussed as follows:—

> All technical publications are dependant to a large degree upon contributed articles. Obviously, it is impossible for any paper to maintain a sufficient staff to properly cover all the ramifications of even a highly specialized field in a country as large as ours. The extent to which the various papers rely upon contributed articles varies widely. On some journals the editorial staff is limited to three or four men who spend nearly all their time in the office editing contributions for publications. On other journals as many as 15 experienced technical editors are employed, each spending a large portion of his time visiting important work and writing his own articles. However, there are several reasons why the engineer should contribute to his technical papers whenever he has information of value to the profession. In the first place his duty to the profession should prompt him to give out the details of any method by which he has secured beneficial results so that other men similarly situated may have the benefit of his experience. This broad-minded spirit is becoming increasingly evident from year to year, and has undoubtedly exerted an important influence in the broadening and strengthening of the entire engineering profession. It is unfair to his associates for anyone to be a sponge, absorbing the good ideas of his fellow-members but refusing to give up any of his own. Aside from this public-spirited policy, the rewards of contributing to the trade journals are also real. The beneficial effects to the author of a well-prepared instructive article are not fuly realised in general. Those engineers in private practice realise this advantage more than those in the employ of other men, although the value is just as great here as elsewhere. It is true that this can be overdone until it becomes mere publicity, a problem with which all editors have to contend.

New Patents.

238. Clements Graaff.—Chemical fire extinguishers.
239. Samuel Michael Schenkein and Otto Paul Richard Lehmann.—Gem polishing machine.
240. Godfrey H. Smith.—Mechanical figure pictorial poster.
241. William Charles Masser.—Improvements in cigar and cigarette holders and the like.
242. Isabella McFadzean, George McFadzean, David Boyd McFadzean, and Andrew McFadzean.—An improved safety hat pin or means for securing a hat on the head of the wearer, applicable also for other purposes.
243. Thomas Robertson Laing.—Improvements in poles for tree guards, palings and the like.
244. Henry Lumley Harland.—Improvements in stamp guides.
245. Henry Lumley Harland.—Improvements in securing mortar box screens.
246. John Henry Exley.—Improvements in pneumatic motor or other tyres in which compressed air can be used.
247. Edgar Arthur Ashcroft.—Improvements in the production of alkali metal alloys by the electrolysis of alkali hydroxide in the molten state and in the obtainment therefrom of alkali metals and alkali metal compounds.
248. Edgar Arthur Ashcroft.—Improvements in the electrolytic manufacture of alkali metals.

COAL MINES RESCUE STATIONS.—II.

Report of the Union Government Committee of Enquiry.

The Report of the Committee of Enquiry into the Natal Coal Mines Rescue Stations concludes as follows:—

THE TRAINING OF MEN ON THE MINES FOR RESCUE WORK.

23. We consider that with slight modifications the latest British regulations as regards rescue stations and appliances should be followed, and suggest that the following regulations be adopted:—(a) There shall be organised and maintained at every colliery a competent rescue brigade consisting of not less than five persons, but the manager of a mine at which the total number of underground employees is less than 100, shall be deemed to have complied with this provision, if he has acquired the privilege of calling a brigade from the nearest colliery possessing such brigade. (b) Every white person employed underground shall be liable, provided he is medically fit, to be called upon to undergo a course of training in rescue work with the rescue apparatus adopted in Natal. (c) A rescue brigade shall consist of not less than five persons employed at the mine, carefully selected on account of their knowledge of underground work, coolness and powers of endurance, and certified to be medically fit, who shall be trained in first aid and shall hold certificates from an Ambulance Association recognised by the Minister of Mines. (d) There shall be selected from each brigade one person who shall act as captain of the brigade. (e) A brigade shall not be deemed competent unless—(1) it undergoes a course of training approved by the Minister of Mines; (2) after the preliminary course of training it should undergo every three months at least one day's practice at the mine with rescue apparatus, and its members at least one day's practice at the rescue station, such latter practice to take place in an irrespirable atmosphere; (3) the members of the brigade shall have received instructions in the reading of mine plans, in the use and construction of breathing apparatus, in the properties and detection of poisonous or inflammable gases, and in the various appliances in connection with the mine rescue and recovery work. We are of the opinion that men undergoing training or attending practices should be paid by their respective employers at the full rates they obtain for their ordinary duties. We think the details of training at the station should be left to the instructor, in consultation with the Committee of Management.

THE METHOD OF DEFRAYING THE EXPENDITURE TO BE INCURRED.

24. We consider it would be best, to ensure uniformity, that all expenses connected with rescue work, except as otherwise specified, should in the first instance be borne by the central rescue station, and where mines must have their own liquid air producing plants, the cost of such should also be charged up to the central rescue station. The central rescue station should supply and maintain all the necessary equipment to all the mines, which equipment should be paid for on a tonnage basis or otherwise as may be decided by the Committee of Management. We are emphatic that all collieries should be compelled to contribute. We estimate that once the station is in working order, the upkeep would amount to about £1,000 per annum, made up as under: Salary of instructor, £400; salary of assistant, £180; three natives at £3 per month (say), £100, renewals, contingencies, repairs, cost of running motor, £200, cost of power (say) £10 per month, £120; total, £1,000. The amount contributed by the mines to be paid monthly and adjusted finally at the end of each year. The outlying mines having their own liquid air plants would have to incur a small extra expense. With regard to the initial cost of erection of the station, training gallery, etc., your Committee desires to bring the following facts to your notice: (1) That the Natal collieries have exceptional conditions, making the costs higher than in the other coalfields of the Union; (2) that the expenses of erecting a station would fall heavily on the collieries; (3) that once the station is erected, and trained men are turned out from it, there can be no guarantee that the trained men will not be offered higher salaries in other parts of the Union, on account of the training they have received at the Natal rescue station. That therefore the Natal collieries would be bearing the expense of the rescue station and the training of the men while mines in other parts of the Union would undoubtedly derive benefit therefrom. We are therefore in agreement with Clause 160* on page 17 of the report of the Committee appointed in 1911 to enquire into explosions of gas and dust in Natal collieries, recommending that the Union Government might well bear the first cost of erecting and equipping the station, all costs afterwards to be borne by the Natal collieries. We estimate that the cost of the station would be roughly £6.000, made up as under: Erection of station and training gallery, £2,000; erection of instructor's house, £500; mtoor car, £750; power plant, £300; six sets of apparatus, £175; four small liquid air plants for outlying collieries (say), £750; four storage cylinders, £80; unforeseen contingencies, £320; main liquid air plant, £1,125; total, £6,000. We are satisfied that this is the minimum cost of a properly equipped rescue station. In the Natal Cambrian and Glencoe explosions, which cost individually far more than would equip such a station as we have suggested, it is probable that the fire in each case could have been reached and extinguished, and the subsequent explosions avoided, had a trained rescue brigade been available. We would further point out that once the Natal men have been trained, they will require but few practices to keep them efficient, and no doubt arrangements could be made whereby men from other Provinces of the Union could receive training at the Natal station. 25. We have gone as fully as we can into which form of rescue apparatus would be most suitable for Natal. All types of rescue apparatus have faults, and there is little choice between the best. Committees in different parts of the world have gone into the matter; some have recommended one apparatus, some another. We are most emphatic in recommending that one make of apparatus only should be used in Natal, so that, no matter which mine a man goes to, he will be accustomed to the type of apparatus to be found there. Of the various types of apparatus submitted to us, we think the liquid air apparatus, Draeger and Proto, are all good, but have decided to recommend the liquid air apparatus for the following reasons: (1) It has the largest reserve of oxygen, and by means of a simple fitting persons found alive in a mine could be taken out through a poisonous atmosphere; (2) it is being adopted in several of the most modern rescue stations in Great Britain; (3) it is beyond the control and interference of the worker; (4) it is cool; (5) it is light and simple; (6) the cost for practice is considerably less than that of the other types of apparatus; (7) it requires practically no chemicals. The disadvantages of the apparatus are the heavy initial cost of the plant, and the rapid evaporation of the liquid air. We cannot overlook, however, that it is possible that further developments and improvements in rescue apparatus may occur between now and the establishment of the station, which of course the Committee of Management would take into consideration. We consider that at no mine should less than two sets of the apparatus be kept, and not more than six, but the actual number might well be left to the decision of the Inspector of Mines. As many of the collieries are widely separated, we think the outlying mines should manufacture their own liquid air; the price of a small plant for this purpose would be approximately £180. It would not be economical to manufacture liquid air at Hatting

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*160. Considering the large sums of money being spent in Great Britain on this dust and gas question, it seems reasonable that the South African Government should support at least one small properly equipped rescue station in Natal, where a permanent staff of, say, one white man and a few native assistants could train batches of men from the neighbouring collieries for rescue and exploratory work in the some half dozen pits where we anticipate the most danger.

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Spruit for transport to outlying mines, as the rapid evaporation and difficulties of transport would necessitate the constant sending to and fro of cylinders. With a rescue station at Hatting Spruit, we would suggest that liquid air apparatus, liquid air cylinders, etc., should be kept by the mines as under:—

Mine.	Distance from Rescue station.	No. of Sets of Apparatus.	No. of Cylinders.
St. George's Colliery	2 miles.	3	1
Glencoe (Natal)	2 miles.	3	1
Burnside Colliery	18 miles.	5	2
Natal Navigation (3 Pits)	5 miles.	5	2
South African Collieries	8 miles.	3	2
Hatting Spruit Colliery	2 miles.	2	1
Natal Cambrian Colliery	7 miles.	5	2
Durban Navigation Colliery	10 miles.	5	2

The above mines could obtain their supply of liquid air from the central rescue station.

Mine.	Distance from Rescue station.	No. of Sets of Apparatus.	No. of Cylinders.
Elandslaagte Collieries	30 miles.	3	1
Ramsay Colliery	25 miles.	5	1
Natal Steam Coal Co.	25 miles.	0	1

These three mines would require a small liquid air plant between them, say at Elandslaagte, capable of manufacturing 1 lb. of liquid air per hour at a cost of £180. Ramsay and Natal Steam being small collieries, adjoining each other, would be served with one rescue brigade between them.

Mine.	Distance from Rescue station.	No. of Sets of Apparatus.	No. of Cylinders.
Ballengeich Colliery	20 miles.	3	1
Newcastle Colliery	30 miles.	3	2
Fairleigh Colliery	30 miles.	2	2

These collieries again would have a liquid air plant between them which could be set up at the Ballengeich Colliery.

Mine.	Distance from Rescue station.	No of Sets of Apparatus.	No. of Cylinders.
Hlobane Colliery	70 miles.	6	1
Utrecht Colliery	50 miles.	6	1

Each of these collieries must have its own liquid air plant. By a set of apparatus is understood: 1 Aeorphor liquid air pack, £21; 1 Ramsay mask with asbestos skull cap, £2 12s. 6d.; exhaust fittings thereto, £2 15s.; total cost, £26 7s. 6d. The cylinders, each holding 50 lbs., cost £17 10s. each. Some of the above mines, though at present non-gaseous, will probably become gaseous at some time not far distant, and within the last twelve months fires have occurred at a wet and non-gaseous mine, at which rescue apparatus in the hands of trained persons would have been invaluable. When once established, and the apparatus purchased, the cost of maintenance of the station and the brigade should not be a very heavy charge on the mines. 26. Beyond suggesting that the English regulations on rescue work be slightly modified to suit local conditions, we do not think it necessary to recommend that any special regulations be framed. 27. There are various types of oxygen reviving apparatus; the two best known being the Pulmotor automatic oxygen reviving apparatus, and the Dr. Brat apparatus. Both these apparatus are useful, and one or the other should be provided at the rescue station. 28. We are not in a position to say which type of electric lamp is the best, but recommend that the ordinary dry cell battery lamps be provided.

CONCLUSION

29. We would sum up our conclusions and recommendations thus:—

(1) That a central rescue station be established at or near Hatting Spruit.

(2) That the men be trained at the station, in an irrespirable atmosphere.

(3) That after training the men be exercised at intervals.

(4) That each mine be equipped with sets of apparatus.

(5) That every miner physically and otherwise qualified should be compelled to undergo training.

(6) That the apparatus recommended be the liquid air apparatus.

(7) That the initial cost of establishing a central rescue station be borne by Government, and the subsequent working costs by all the collieries.

We feel that once the rescue station is completed, and the method of apportioning the costs determined on the basis we have suggested, that the Committee of Management of the rescue station would see that the men are properly trained and equipped for rescue work. In the event of a disaster, there would thus be a sufficient number of rescue brigades available at short notice..—We have the honour to be, Sir, your obedient servants,

J. E. VAUGHAN, Chairman.
J. T. WILLIAMS.
F. A. STEART.
OWEN WALTERS.

The Del Monte Process of Coal Distillation.

The Del Monte plant for the distillation of oils from coal, shale, peat, sludge, etc., which is now being operated on a commercial scale by Messrs. Oil and Carbon Products, Ltd., has lately come in for much attention. The Del Monte retort is extraordinarily compact as compared with the standard Scottish shale oil plant; it consists essentially of an inclined steel tube 18 ft. long and 14 in. diameter, into the lower end of which fuel is fed through a hopper and conveyed up the tube by a revolving cast-iron worm, being finally discharged as coke at the upper end. The feed and discharge valves are arranged for simultaneous operation. The retort is enclosed in a brickwork chamber and heated at the sides by gas flames to a moderate temperature—which can be adjusted at various points—reaching about 450° C. at the point where full distillation takes place. The feature of the process is the collection of the distilied oil vapour, and this is effected by forcing a current of gas in at the discharging end of the worm—incidentally cooling the coke—the gas as it passes along the retort carrying with it the oil vapours at the moment of formation into the cool neighbourhood of the entering material, where they are condensed, the oil being subsequently removed at intervals. The lighter fractions, which will not liquify in this way, are carried off in the gas to a scrubber, and recovered in the usual way, the gas subsequently being used for retort heating, etc. A single unit retort deals with 10 tons of bituminous coal, or 5 tons of hard cannel or shale a day, the yield of oil (which on treatment yields a high percentage of motor spirit, and all the usual petroleum products), varying from 25 to 130 gallons a ton. In view of the attention which is being directed to the gasification of fuel, and recovery of by-products in connection with bulk electricity generating schemes, the above process may interest electrical engineers. The coke secured from the Del Monte process is quite suitable for gas production, and the subsequent ammonia recovery treatment. It is stated that a ton of cannel coal, costing 7s., used in this process, has given some 68,000 cub. ft. of gas (some of which is used for retort heating), 58½ gallons of crude oil, and 54½ lbs. of sulphate of ammonia.

Bloemhof Fields' New Rush.

The returns of diamonds found and actually sold in the district for the month of June total 3,741½ carats, valued at £15,556 1s. The new rush at the limekilns still continues to attract hundreds of diggers. Over a thousand men are digging there and two thousand five hundred claims have been pegged off. Some very pretty stones have been taken out, and I hear from a reliable source that diamonds to the value of £600 are being sold daily. A rumour of a 400 carat stone, valued at £8,000, caused great excitement, but up to the present no one has seen the stone. A pretty stone weighing 13½ carats was sold for £90, and an amber stone weighing 7½ carats has been found near the pan. Every yard of ground is pegged off between the limekilns and the pan, and the place already looks like a small township of a few days' growth.

Attention may be drawn to the work done by a machine—the only one of its kind in South Africa—by the aid of which drawings, both ink and pencil, tracings, blue prints, maps, plans, diagrams, catalogues, sheets of statistics, and documents of all kinds are reproduced by a photographic process on bromide paper at a few minutes' notice—black lines on white ground, or *vice versa*. This process should prove of the utmost use to engineers, architects, and all connected with the preparation of plans, maps and documents. Subjects can be enlarged or reduced to any size required. It may be pointed out that this method saves all the labour of tracing and that blue prints are reproduced direct—black on white. Full particulars can be obtained on application to 30, New Court Buildings (next Chamber of Mines). Tel. 5227. Box 3005.

Finance, Commerce, and Industries.

Municipal Debts.

According to the *Financial News*, Durban is one of the most heavily indebted municipalities, *per capita*, in the Empire. It appears that municipalities with debts of £20 and over per head of the population are all situated in the Dominions. The following are the figures for some of the principal towns in South Africa:—Pretoria, £32 11s. 5d.; Durban, £32 9s. 11d.; Johannesburg, £23 3s. 4d.; Capetown, £21 16s. 3d.; Bloemfontein, £13 1s. 9d. Durban also enjoys the unenviable reputation of financing by means of bank overdrafts, adds the *South African Accountant and Auditor*. At the present moment the municipality's overdraft approximates £331,000.

* * * *

Ocean Freights on Iron and Steel Bars.

A notice has been issued (dated 20th May) to shippers to the Union ports of South Africa, Delagoa Bay, Beira, and Mauritius that, owing to serious difficulties having arisen in delivering bars and bundles of iron to consignees through the absence of marks when landed, and the dissatisfaction of consignees, and delay which has been occasioned in the separation of the different shipments, it has been agreed that the following conditions should be adopted to come into force on shipments from United Kingdom ports, as from 1st June, 1911, viz.: (1) All small bars ought to be bundled. Shippers who desire a satisfactory outturn are strongly recommended to follow this course. (2) Every bundle, and every loose bar, must be marked. (At present often only 10 per cent. of the bars, or fewer, are marked.) In future, receipts will only be signed for marks when all bars or bundles are marked, otherwise receipts will be claused. (3) The marks must be distinct and of a permanent character, not liable to be obliterated or detached before the cargo is delivered. Bars should have their ends dipped for several inches in quick-drying oil paints of distinctive colours, which must be dry when delivered to steamer. Bundles should have metal tallies firmly attached by wire to the bands.

* * * *

Big Johannesburg Municipal Scheme.

At last week's meeting of Johannesburg Town Council, Mr. A. E. A. Williamson moved: "That the General Purposes Committee be requested to report upon the advisability of carrying out a scheme providing for the local issue of Municipal stock on certain terms and conditions, whereby the moneys so received could be profitably used, and the profits thereby accruing should be definitely earmarked for the promotion of permanent industries in this town." Mr. Williamson then read the following statement which he had prepared on the matter:—

The Fund shall be known as the Johannesburg Municipal Treasury Stock Fund. Interest will be allowed at the rate of 4 per cent. per annum from the date of deposit to the date of withdrawal. Interest will, in the ordinary way, be payable either quarterly or half-yearly, as the depositor may desire. Certificates will be issued under the seal of the Council for the amount of each deposit made. Such certificates will carry the Council's guarantee for the payment of both principal and interest. No certificate will be issued for a larger sum than £2,000. Certificates up to £250, with accrued interest, will be payable on demand. Certificates over £250 will be payable at 30 days' notice. The Fund shall be controlled and operated upon by a Committee, consisting of the Mayor, the Chairman of the Finance Committee, and the Town Treasurer. All deposits made into this Fund shall be placed in a separate banking account with the Municipality's bankers. An amount equal to 20 per cent. of the total funds received shall be placed on fixed deposit with the Municipality's bankers, the interest received thereon to be repaid into the Fund. At regular half-yearly intervals this setting aside of 20 per cent. of the funds received shall be adjusted. The balance of 80 per cent. of the deposits received shall be used for the purchase of Johannesburg Municipal 4 per cent. stock, whenever such stock can be purchased at a discount. In the event of such stock not being purchasable at a discount, then the available funds shall be loaned to the Municipality for its capital or ordinary requirements at the rate of 4½ per cent. per annum. The total amount to be received into this Fund not to at any time exceed £1,000,000. Whenever any purchase of Johannesburg Municipal stock shall have been made out of this Fund, the stock certificates shall be duly cancelled directly the following requirements have been complied with, viz.: (a) A payment into the Fund by the Municipal Treasury of an amount equal to the difference between the price paid by the Fund for the stock purchased and the face value of same; (b) a certificate to be issued to the Fund setting forth the indebtedness of the Municipal Treasury to this Fund of an amount equal to the face value of the stock to be cancelled. At half-yearly periods the accounts of the Fund shall be compiled, and the profits shown to have been made shall be used for the further purchases of Johannesburg Municipal stock at a discount. For a period of four years after the expiration of the first year the Municipality shall redeem in cash, at the face value, all such purchases of stock made out of the profits of the Fund. This period of four years to be extended from time to time. The cash so received by the Fund shall be paid into a separate Trust Fund to be known as the Johannesburg Industries Endowment Fund. This Fund to be under the control and expended at the discretion of the same Committee as the one controlling the Treasury Stock Fund. The Endowment Fund shall be used for the specific object of promoting the growth of permanent industrial concerns within the Municipal boundaries. The following are, *inter alia*, some of the more important purposes for which the Fund can be used: (1) Direct cash bonuses on manufactured goods or on the products of industries exported outside of the mining area; (2) loans or grants to industrial ventures; (3) purchase of land, power, water or traction from the Municipality or others at cost, and granting such facilities to industrial ventures at lower prices; (4) engaging the advices of experts to aid and assist in the promotion of new industrial ventures; (5) special grants for experimental purposes; (6) subsidising of industrial and technical schools. Mr. Williamson then offered a few remarks in explanation of the scheme. As the powers of the Town Council stood to-day, he said, very little could be done in the direction desired. It would be necessary for these powers to be considerably augmented. His reason for asking the Council to consider this question was that it must be patent to all that the time had arrived for the city of Johannesburg, and particularly the Municipality, to take some steps towards the promotion of industries to take the place of the mining industry as it gradually petered out.

* * * *

Rustenburg Cotton Ginnery.

On the 19th May the Rustenburg Cotton Ginnery, established by the Boeren Ko-operatieve Vereniging, was opened. General Beyers delivered the opening address, thereafter pulling the lever which set two American 80-saw gins in operation. A supply of cotton was ready for the gins, which started working at once. There were about one hundred farmers present, who showed much interest in the new venture. Remarkable interest is indeed being taken in cotton culture in the district, and the management of the new ginnery have already received about 170,000 lbs. of seed (or unginned) cotton from the farmers, whilst there is a similar quantity still due to come. Much extra land is being put under the crop; and with a favourable season next year there will be a great increase in the output. Many farmers have given up tobacco completely in favour of cotton, in consequence of the greater resistance to adverse conditions evinced by the latter crop during the last two dry seasons. At the opening ceremony of the ginnery, Mr. W. H. Scherffius, Chief of the Tobacco and Cotton Division, Union Department of Agriculture, delivered an interesting address

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in which he just dealt with cotton from the historical side, and then proceeded to discuss the development of the industry in South Africa. He then went on to consider the practical side of cotton growing. He observed that, when we have climatic conditions favourable, cotton can be grown on a variety of soils, such as black turf, broken turf, red sandy loam, black sandy loam, clay loam, alluvial soils, and many gradations of these. Clay loams and rich alluvial soils, in wet seasons, have a tendency to develop large stalks with heavy foliage and a small proportion of lint, but with a favourable season they give fine yields of cotton. With scant rain, once the plants are established, black turf soil will probably give fair results, but with a good season splendid results could be expected from black turf soil. In this connection, generally speaking, irrigation is not recommended for cotton, but if one has his furrow laid on and can irrigate with little expense, no doubt during a dry season it will pay handsomely. The soil should, if possible, be kept moist but not wet.

* * * *

Kynoch's Increased Dividend.

Now that Kynoch's report is to hand, it would appear that the advance in the dividend from 2½ per cent. to 5 per cent. is not due to any increase of profits, but is presumably an anticipation of benefits the company expects to derive from the policy of concentration now being adopted. As a matter of fact, the profits are £3,800 less at £122,500. Capital expenditure and investments are written down by £17,000, against £10,000, a sum of £3,000, against nothing, is placed to bad debt reserve, and £10,300, against £29,300, is carried forward. The decline in profits is attributed to the disturbed labour conditions in South Africa, the strike on the Rand, and the Indian and railway strikes, all of which seriously curtailed the output of the South African factory during the past year.

* * * *

New Cape Central Railway.

Out of the profits of 1913 the directors of the New Cape Central Railway propose to pay the full rate of interest on the Cumulative Income Debenture stock—namely, 4 per cent., as against 4½ per cent. twelve months ago, when ½ per cent. of arrears were outstanding. After transferring £2,000 to reserve fund there remains a surplus, including the balance brought forward, of £21,500, which has been applied in writing down the accumulated deficit of £22,100 on profit and loss account to £600. The trading profit for 1913 amounted to £55,400, an increase of £9,700, so that the company made excellent progress during the period under review, while the outlook for 1914 is rendered encouraging by the satisfactory results which are accruing from the working of the new Oudtshoorn line.

* * * *

Capetown Tramways.

No progress is being made by the various undertakings controlled by the Capetown Consolidated Tramways and Land Company, and the debit balance, which has been steadily growing since the re-organisation in 1906, now totals £8,100. The net loss for the year amounted to £1,800, which is £100 more than in the preceding twelve months, mainly accounted for by an increase in interest charges. It cannot be said that the company is run on extravagant lines, but while the income remains practically nil it is impossible to make both ends meet. The most hopeful of the subsidiary undertakings is the Camps Bay Tramways, and that company suffered a set-back in the past year, the profits dropping from £3,000 to £1,600 in spite of increased traffic, owing to heavier expenditure on the permanent way and damages paid as the result of an accident early in the year.

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E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Eloff Street, Johannesburg, P.O. Box 2061.

Ohlsson's Cape Breweries.

The profit of £87,000 earned by Ohlsson's Cape Breweries during the year ended 31st March last represents an increase of £2,400. As, however, the surplus of £33,200 brought forward was £12,200 less than the corresponding figure twelve months ago, the credit balance at the date of these accounts of £120,800 represents a reduction of £9,800. During the period under review additions to plant and machinery cost £15,800, a drop of £1,100, and after again paying a dividend of 8 per cent. on the Ordinary shares, there remains to be carried forward £21,000. This is the second year that the accumulated surplus at credit of profit and loss account has been reduced, but it must be borne in mind that the company is paying for the development of its trade in bottled beers (and the erection of the necessary depot at Bulawayo) out of profits.

* * * *

South African Breweries.

The directors of the South African Breweries Company have decided for the fourth year in succession to make the dividend for 1913-14 on the Ordinary shares up to 17½ per cent., the reserve fund again receiving an addition of £20,000, which brings the total up apparently to £690,000; this leaves £39,200 to be carried forward, in which is included £38,800 brought over from 1912-13. The directors appear to have decided not to raise the dividend above 12½ per cent. for the present, no matter what the earnings may be, and they have thereby been enabled to build up a financial position of considerable strength.

New Registrations.

The Volksrust Mahomedan Mosque, Erf 68, Noord Street, Volksrust; unlimited company.
Thrupp's, Ltd., 94 Pritchard Street, Johannesburg; capital £5,500.
Salai & Dickinson, Ltd., 14 Bureau Street, Pretoria; capital £1,500.
Harvey & Russell, Ltd., 96 Frederick Street, Johannesburg; capital £10,000.
Norwood Township Agency, Ltd., 16 New Court Buildings, Market Street, Johannesburg; capital £500.
Sterkspruit Farming Syndicate, Ltd., farm Sterkspruit No. 159, district Lydenburg; capital £1,000.
The African Prospectors' Company, Ltd., 55-60 Meischke's Buildings, Harrison Street, Johannesburg; capital £500.
H. T. Matthews & Co., Ltd., Stand No. 36, Seventh Street, Springs, Transvaal; capital £2,500.
Hellenic Commercial Co. (S.A.), Ltd., 12 Reserve and Investment Buildings, Fox Street, Johannesburg; capital £11,000.
Boston Diamond Syndicate, Ltd., 8 Standard Bank Chambers, Commissioner Street, Johannesburg; capital £4,000.
The Columb Tyres Import Co., Ltd., 3 and 4 New Club Buildings, Loveday Street, Johannesburg; capital £2,000.
Colonial Estates and Plantations, Ltd., 13 Standard Bank Chambers, Commissioner Street, Johannesburg; capital £2,500.
Peter Union Tyre Co. (S.A.), Ltd., 12 Corporation Buildings, Commissioner Street, Johannesburg; capital £200.

FOREIGN COMPANIES.

The Tobacco Company of Rhodesia and South Africa, Ltd., c/o Michael Pevsner, 5 Fraser Street, Johannesburg; capital £250,000.
International Channelling Machines (1913), Ltd., c/o S. A. Jones, 111 and 112 Cullinan Building, Johannesburg; capital £25,000.
The C.B.R. Gold Reefs, Ltd., c/o Frank Wylder Reed, Dientje No. 552, Pilgrims Rest, Lydenburg; capital £20,000.
Valley Prospecting Syndicate, Ltd., c/o H. B. White, Eureka, Transvaal; capital £2,500.
New Refractory Ores, Ltd., c/o L. O. Lloyd, Bussey Buildings, Commissioner Street, Johannesburg; capital £60,000.
North Bonanza G.M. Co., Ltd., c/o T. E. Duckles, 82-84 Exploration Building, Johannesburg; capital £50,000.

INCREASES AND DECREASE OF CAPITAL.

United Jack G.M. Co., Ltd., Pretoria: increased from £50,000 to £65,000.
The G. and S. Syndicate, Ltd., Johannesburg: increased from £1,000 to £1,200.
Klerksdorp Proprietary Mines, Ltd., Johannesburg; decreased from £150,000 to £50,000.

VOLUNTARY LIQUIDATIONS.

Suburban Estates Co., Ltd., Johannesburg.
Macdonald & Thorpe, Ltd., Pretoria.

The best "Reef Traveller" is the *South African Mining Journal.*

Automobile Notes.

Railways and the Commercial Motor.

Last year served to remove any traces that remained of disbelief concerning commercial motors on the part of railway companies in England and on the Continent. Recurring labour troubles may or may not have had their influence; we are inclined to attach less importance to this aspect of the situation than to effects of the inherent merits of motor transport upon the various departments of railway activity. Speed counts as much as cleanliness, and low working cost above all. The absence of necessity for holiday and Sunday attendance also tells its tale. The lead of the Great Western Railway Co. in the matter of passenger transport, which dates back more than ten years, has put that prominent British line in a very powerful position as regards accumulated experience. The year 1913 has seen very large additions to its order list, both for country-motorbus and town-delivery-van purposes. The London and North Western Railway Co. has similarly placed very considerable orders, but the bulk of these concern the goods side. The Caledonian, the Great Central, the Glasgow and South Western, the Great North of Scotland, the Great Southern and Western of Ireland, the Great Northern, the Great Eastern, the Lancashire and Yorkshire, the Midland, the North Eastern, the North Staffordshire, the North British, and other Home railways have also again come into the market as buyers, in many cases after considerable periods of experimental running. It is, in fact, generally accepted in railway circles, that motor buses and motor vans must be ordered for "feeding" purposes. The two-horse van is already shown to be uneconomical, as compared with motor vans, for town collection and delivery purposes, and the one-horse van is seriously challenged. A motor van, in average traffic, saves six minutes per mile and 2½ minutes per parcel. In South Africa the advantage is even more clearly on the side of the mechanically-propelled vehicle.

Motor Plough Development.

Reviewing the whole field of operations of the cultivation of the land by mechanical means, one is forced to the conclusion that, during the past twelve months, whilst progress has been steady in respect of the employment of large and expensive plants for big areas, the real note of development proper has been in connection with the investigation of the possibilities of the small power-operated cultivating tackle. We have often made references to that class of agrimotor which finds satisfactory employment in the breaking open of prairie land and in the cultivation of great tracts of crop-producing country, but, as we have said, during the past year little surprising development has taken place in that direction. We still know that for certain conditions the big power-driven agrimotor, acting as tractor and hauling after it gang implements, represents an extraordinary advance upon the horse or oxen-pulled ploughs or cultivators which have been in use in various parts of the world from time immemorial. It is in France that the most encouraging enterprise has to be noted in connection with the smaller classes of power-driven plant. A number of local organized ploughing and cultivating tests has, during the past year, been successfully carried out in provincial France. The prizes then offered, to say nothing of the accompanying prospects of business, have attracted quite a respectable number of constructors. That all those which have been so far developed as to be enabled to take their places in the ranks of the competitors are practical machines, we by no means agree. A new phase of industry such as this always attracts the unbalanced inventor, but is is from a flood of new ideas of this kind that eventually there are evolved the one or two types which are destined ultimately to prove practicable solutions of the problems which have had to be faced.

Zaaiplaats Tin.

The results for the month of June, 1911, are as follows: Days run, 27 days; ore milled, 3,195 short tons; residues re-treated, 1,720 short tons; concentrates won, 100 long tons; average value of concentrates, 68·5 metallic tin; estimated profit for the month, excluding Government tax on profits, £2,899 4s. 0d.; less adjustments in respect of estimated values of previous shipments, £20 1s. 4d.; profit declared for the month, £2,879 2s. 8d.; capital expenditure, £312 10s. 0d.

"Salomon's Tempel" Sold for £1,500.

Mr. [illegible] sold the farm known as Salomon's Tempel this week by auction for £1,500. The property is devoted to the exploitation of tin, and is 3,632 morgen in extent. It was pointed out by the auctioneer yesterday to the eighty or so prospective buyers who assembled in the auction room that the farm buildings, equipment, and development done have involved an expenditure of £100,000, and that the tin shipments at the end of December 1911, totalled £2,731. Starting at £1,000, the auctioneer advanced steadily to £1,500 at which figure the property was knocked down.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS

July 13.—New Kleinfontein Co. (special).
July 31.—[illegible] Estates; Middelvlei Estate (annual).
Aug. 10.—Jumpers (special).
Sept. 1.—Jumpers (special).
Sept. 13.—Transvaal G.M. Estates (annual).
Sept. 2[illegible].—[illegible], [illegible] and Jack Proprietary (annual).

Diamond Discovery.

The Deputy Mayor of Kingwilliamstown, who has returned from Aliwal North, informs the *Cape Mercury* that diamonds have been found at that place just on the Free State side of the Orange River—on a farm belonging to the De Wets. The discovery was made during the progress of the Zastron railway construction works, and the engineers in charge have lodged six of the precious stones with the local magistrate. It is reported that several natives engaged on the railway work have left their employment without waiting for their wages, and it is just possible they have taken diamonds with them. One rumour is that a boy has got away with a stone worth £900, but as yet it is only a rumour.

Swaziland Tin.

The following are particulars of this company's output for the month of May, 1911:—Concentrates recovered, 36·191 long tons; estimated loss (taking the price of tin at £135 per ton), £240; to which must be added £786, being adjustments in respect of previous shipments; total, £1,026. Economies in working now being effected should cause appreciable improvement in results.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—J. C. Williamson's Co.	8.15
Standard—J. C. Meyer Company	8·15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

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CONTENTS.

PAGE

Notes and News 529

Topics of the Week:

The Dominions Commission Report 531

The Money Outlook 532

Fissure Coals of the Western Province 533

Position of the Randfontein Estates 533

Progress of the Neumann Group 534

Madagascar Oil Flotations 535

Mineral Prospects in Southern Rhodesia 536

The Acting Manager and Underground Staff of the Village Deep, Ltd. 537

The Petroleum Deposits of South Africa and Their Value to the Empire 537

Flotation of the Manambolo Oil Syndicate 539

Increasing Use of Electricity on the Rand 539

Rhodesian Section:

Latest Mining News 540

The June Gold Output in Detail 541

Correspondence and Discussion: "Progress of Falakara Oil" 542

The Week in the Sharemarket 543

Engineering Notes and News 545

A Decade of Metallurgical Progress on the Rand... 546

Some Recent Contributions to S.A. Science 547

Mining Men and Matters 546

Finance, Commerce and Industries 548

Automobile Notes 551

Notes and News.

King Asbestos (Rhodesia), Ltd.

Information has been received by cable that the King Asbestos (Rhodesia), Ltd., has been registered in London with a capital of £125,000, all of which is issued. The first directors of the company are Captain R. Turner, D.S.O., Messrs. Clement Davies, T. A. Sladdin, David Corsar Blair, and John Nicoll. The registered offices of the company are Pinners Hall, Austin Friars, London, E.C., and the secretaries in London and Salisbury, Rhodesia, are The South African and General Investment and Trust Company, Ltd. The company will take over from the vendor certain eight blocks asbestos claims, and eleven blocks chromite claims adjoining, situated in the Mashaba Mountains, district of Victoria. It is expected that the new company will start operations shortly. The working capital is £20,000.

* * * *

Modder Deep Ore Reserves.

The secretary writes: "I am directed to hand you herewith for publication the following particulars of ore reserves in my company's mine as at 30th June last, viz.:—The ore reserves have been calculated as at 30th June last and amount to 1,965,000 tons of developed ore (inclusive of 180,000 tons contained in pillars) having an average assay value of 8·3 dwts., equal to 35s. 3d. per ton, over an assumed stoping width of 69·2 inches. In addition there are partially developed 215,000 tons of an average assay value of 8·2 dwts., equal to 34s. 10d. per ton, over an assumed stoping width of 65·8 inches, making a total of developed and partially developed ore of 2,180,000 tons of an average assay value of 8·3 dwts., equal to 35s. 3d. per ton, over an assumed stoping width of 68·9 inches."

* * * *

Labour Complements and Efficiency.

"Scarcity of native labour" has become a very incessant and monotonous cry in this country, and it would seem that nothing that is new can be written concerning it. But there is at least one aspect of the situation which although perhaps not strikingly novel does not seem to have had much heed given it in the past, and it is certainly worth directing attention to. We refer to the excellent results now being secured by mines notably short of labour. The Wit. Deep, for example, has only little over half of its complement, yet is crushing nearly 80 per cent. of the maximum tonnage practicable with the present equipment. The Randfontein Central, too, which is very short of boys is running 900 or more of the 1,000 stamps. Efficiency bulks even larger in the public view than ever since the issue of the Dominions Royal Commission Report, in which it is insisted that greater efficiency is a crying need of the Rand gold mining industry—South Africa's greatest asset. The facts adduced in the foregoing seem to indicate that *native* efficiency at any rate has improved substantially since the coloured labour complement estimates were framed, and improved native efficiency connotes improved white efficiency, if only of a supervisory nature. Either that or else the complement estimates are very much at variance with actual requirements, and if so it might be suggested that revision of these estimates should be undertaken.

* * * *

Tin and Copper Prices.

There seems at last to be some indication of an improvement in the price of tin, an indication which will assuredly be very welcome in South Africa. On the London Metal Exchange on Thursday Straits tin was quoted at £143 15s. per ton for cash, and £145 2s. 6d. per ton for three months' delivery. Some interesting information is to hand by this mail in Metal Exchange letters relative to the tin market at the end of June. "In the early part of mail week the tone of the market became a little firmer," says an authoritative report. "This recovery was encouraged by the limited sales from the East, and the three months' price improved to £141 10s. On Thursday, however, the East was found to have sold more freely overnight, and the "bears" took the opportunity to depress prices, so that a £1 decline was quickly made. The very heavy fall in this metal has thoroughly scared the trade and outside operators, and find no support is forthcoming from any quarter, the general desire being to look on until the outlook is clearer. Reports from producing centres clearly point to curtailed supplies as a result of the heavy fall, but this factor will hardly make itself felt yet, although it is the all-important point to keep in view." As to copper, standard metal was quoted at £61 2s. 6d. on Thursday last. A London Metal Exchange report, dated June 26, says:—

> Values have suffered a sharp setback this week, the close being 25s. under last Friday's price. We referred last week to the keen competition on the part of American producers to market their copper. This week the selling pressure developed, and dealers relieved them of a certain amount of metal, but this in turn led to dealers and others realising Standard copper, and in the absence of any outside support prices naturally suffered. It is generally recognised that copper now stands at a low figure, and that probably the decline in trade is already largely discounted by the decline in price. Further, those who have followed the movements of the Standard market during the past ten years will recall that the recoveries from the level of £60 have frequently been quick and unexpected. To-day, however, there are so many doubtful points—social, political, and financial—that the most optimistic prefer to look on, whereas in less troublous times they would be taking a hand. There is, therefore, an absolute absence of speculative buying, and the trade purchases are only from day to day. The British demand is quiet, and manufactured sorts have been reduced.

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Gold Fields and African Mica Mines. A recent offer of African Mica Mines shares to shareholders of the Consolidated Gold Fields of South Africa appears to have been made without the knowledge of the management of the latter concern. The London secretary of the Consolidated Gold Fields states that his company knows nothing whatever about the Mica Trust of South Africa or the African Mica Mines, nor were his directors aware that any communication was being addressed by the Mica Trust to Gold Fields' shareholders. If any of the recipients of the circular and abridged prospectus have applied for African Mica Mines shares under the impression that the Gold Fields was fathering the Mica proposition, they of course can cancel their applications.

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Mr. Hennen Jennings on Mining. In a thoughtful and suggestive address delivered at the Columbia semi-centennial by Mr. Hennen Jennings, two facts, in particular, are brought out that are not often appreciated by the man in the street, and perhaps seldom more than dimly apprehended by the men in the thick of mining work. These are the extreme modernness of big mining, and the fact that almost the whole of our present civilisation is due to the extra hands set to work by the miner. It is true that mining itself is very old. How old no one rightly knows, though Mr. Courtenay De Kalb shows that in biblical times it was a well-established industry. It was not, however, until the last few decades that mining became a big industry. It was only during the war of 1812 that development began in the Pennsylvania coalfields, and it was many years later that the great coal and iron industries of the East made their rapid growth. The ancient world depended upon the capricious winds, on beasts of burden, and on slaves to do its work. The modern world depends upon fuel and metals.

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The Mining Institute. The arrangements to provide for additional accommodation necessitated by the steadily increasing number of mine officials attending Professor Yates' special courses have, we understand, now been completed, and all the classes are again in session and, by request, the time table has been revised with a view to obtaining the [illegible] of convenience for all sections. Recent examinations have added still further to the list of remarkable successes under the Professor's guidance, some of the 1914 achievements being as follows:—Mine Managers' examination, January, all passed; Electrical Engineers' examination, February, 66% passed; Mine Managers' examination, May, all passed; Mechanical Engineers' examination, June (Kimberley Course), all passed; Mine Overseers, throughout 1914, practically all passed. Nearly two hundred students have secured their certificates. Such results speak volumes for the care and thoroughness with which our mine officials are prepared for these important examinations, and, as persistent advocates of a policy of competence, efficiency and safety on our mines, we are gratified to see the increasing strength of this demand for specialised higher technical education.

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National and Natal Bank Amalgamation. It is officially stated that the Natal Bank and the National Bank are to be amalgamated under the name of the latter. The absorption of the Bank of Africa by the National Bank is still fresh in the public mind. The General Manager of the Natal Bank has authorised the publication of the following statement: "Consequent upon an agreement for amalgamation entered into with the National Bank of South Africa, Ltd., the board of directors of the Natal Bank, Ltd., do not propose to declare an interim dividend as at 30th June." It is understood that this amalgamation was first mooted eighteen months ago. Full details of the financial position of both banks will appear in our special financial supplement, which it is hoped to issue next week. The full terms in connection with the amalgamation of the Natal Bank and the National Bank are now available. The following are the main pionts of settlement: (1) The purchase price is 50,000 fully paid up shares in the National Bank, distributed to the Natal Bank shareholders in proportion to their holdings, shareholders having the right to elect to be paid in cash instead of shares, at £11 10s. per share. (2) The National Bank adds to the reserve fund of the Natal Bank for distribution amongst its shareholders £7,500, making the fund £400,000. (3) The reserve fund is excluded from sale. (4) The National Bank takes over all officials and employees at the remuneration they are now receiving, and the pension fund. (5) Three of the Natal Bank directors, to be nominated by their own board, and one member of the London committee to join the board of the National Bank. (6) Others will be adequately compensated for the loss of office. (7) The reserve fund of the Natal Bank will be represented by assets of the bank selected by the Natal Bank at the values which they appear in the books of the Natal Bank. The directors of the Natal Bank undertake that they will not declare any dividends, nor will the shareholders of the Natal Bank be entitled to a share in any dividend declared by the National Bank, in respect of the period ending September 30, 1914.

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Science Congress. The twelfth annual congress of the South African Association for the Advancement of Science, held at Kimberley last week, was a great success. Representative members of the South African Institute of Electrical Engineers, and the Chemical, Metallurgical and Mining Society of South Africa attended the sessions. The South African gold medal, the gift of the British Association for distinctive research work, was presented to Dr. Marloth by Prof. Crawford, together with a special money grant of £50. Prof. Crawford stated amid applause that this was a notable tribute to the work of their president, with whose distinguished career they were all more or less familiar. His labours had largely contributed to the advancement of science in South Africa. There were various social functions in connection with the Congress and the Medical Congress. Interesting visits were paid to De Beers Diamond Mines, Matjesfontein, the De Beers Stud Farms, and other places of interest. The De Beers Company extended its usual hospitality, as well as the Mayor, the City Council and prominent citizens. The annual general meeting of the Association was attended by a good number of members. The officers for the coming year were elected as follows: President, Mr. R. T. A. Innes, F.R.A.S., F.R.S.E., Government Astronomer, Johannesburg; vice-presidents, Prof. Crawford, Sir Arnold Theiler, Dr. Watkins and Mr. G. W. Herdman; general secretaries, Dr. Juritz and Mr. H. E. Wood; general treasurer, Mr. A. Walsh; Council members: Cape Province: Cape Peninsula, Dr. A. J. Anderson, Rev. Dr. Flint, Prof. H. Bohle, Dr. J.

Lunt and Mr. A. H. Reid. Grahamstown: Prof. Schwarz. Kimberley: Mr. Alpheus Williams. Kingwilliamstown: Dr. A. H. Roberts. Port Elizabeth: Mr. W. A. Way. Middelburg: Mr. A. Stead. Stellenbosch: Prof. E. J. Goddard. Transvaal: Johannesburg: Messrs. P. Cazalet, W. Elsdon Dew, S. Evans, F. Flowers, J. A. Foote, J. Kirkland, Prof. Orr and Prof. Stanley, Pretoria; Prof. D. F. Malherbe, Mr. D. Kehoe and Mr. J. L. Soutter. Potchefstroom: Mr. F. G. Tyers. Natal: Maritzburg: Dr. J. Hyslop. Rhodesia: Bulawayo: Rev. S. Dorman. Mozambique: Lieut. A. da Teisceira. After an animated discussion it was resolved that an ordinary member may, after ten years, provided that yearly subscriptions have been regularly paid, become a life member by one payment of £5 in lieu of future annual subscriptions. It was also resolved, on the proposition of Dr. Juritz, that the clause reading, "Who is not over the prescribed age for exhibitions at matriculation examination," be added to section B of rules for award of the Goold-Adams medals. The next annual meeting of the Association will be held in Pretoria.

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Leeuwpcort Tin Plant.

In our last issue there appeared a letter from Messrs. Sturrock & Co. correcting us for saying that Messrs. Fraser & Chalmers supplied the concentrating plant at Leeuwpoort Tin Mine, and that "these Buss tables" were a new feature in a *tin* plant in this country. It is true that Messrs. Fraser & Chalmers had the biggest orders (*i.e.*, including the Holmans), but it is only fair to state that Messrs. Sturroek & Co. supplied the Buss tables; Allis Chalmers (H. Ainsworth) supplied the R. J. classifiers, Isbell frue vanners, idlers, etc.; the United Engineering Company supplied the tube mill, shoes and dies, stamp heads, etc.; Messrs. Blane & Co. the Premier gas engines; and the Union Electric Company the motors, etc. With regard to the second point, it may be explained that the four Buss tables at Leeuwpoort are the only *ones working* on tin in South Africa. The following six constitute the whole of the tin mines in the Transvaal:—(1) Rooiberg used 1 Buss table in old mill (1909-1912), (2) Zaaiplaats used 2 Buss slimers, no tables; (3) Leeuwpoort using 4 Buss tables; (4) Welgevonden used 4 Wilfley tables, no Buss tables; (5) Doornhock used ? Wilfley tables, no Buss tables; (6) Weyneck used 4 Wilfley tables, no Buss tables. To Mr. J. I. Jameson, the manager of Leeuwpoort credit should be given for erecting the one Buss table at Rooiberg in the old plant towards the end of 1909, and it ran in the old mill until the latter was closed down in May, 1912. No Buss tables were erected in the New Rooiberg mill, which started up May, 1912, *i.e.*, two years ago—hence the Leeuwpoort Buss tables are the *only* ones *working* in this country on tin. The two Buss slimers were erected at Zaaiplaats about 1908 by Mr. Furner—they are not in use now (March, 1914). These machines are *not* Buss tables and are a comparative failure for their purpose, owing to costly upkeep. The reason no Buss tables were put in the New Rooiberg plant was on account of the opinion held by Mr. Amos Treloar (tin dresser) in opposition to that of the manager, Mr. Jameson. It appeared that his old mine, East Pool in Cornwall, had *none*, whilst South Crofty has all Buss and *no* Wilfley tables. In spite of all efforts they were left out at Rooiberg; but the same mistake has not been made at Leeuwpoort, where they contemplate putting in more in connection with the proposed regrinding plant. In connection with Buss tables and their merits—and as showing the effect of time—it is noteworthy that in the current number of the *Mining Magazine* (June, 1914) there is a photograph of the East Pool mill, and on the left hand side under "Concentration at East Pool" they talk of a "modified Wilfley table," which has the identical and distinguishing feature of a Buss table, viz., wooden ash spring lathes instead of rockers. This is interesting at this date, as this mill happens to be Mr. Amos Treloar's old mill, which has apparently at last been converted.

TOPICS OF THE WEEK.

THE DOMINIONS' COMMISSION REPORT.

No one who followed the evidence led before the Dominions Royal Commission on the Rand and noted its effect on that body can pretend to be surprised at the tenour of the interim report issued in London this week. The report, summed up in a sentence, is very good in parts. However much we may find ourselves in disagreement with the recommendations on some matters, there can be no question that on many of the main essentials of the position it has got hold of the right end of the stick. Indeed, we could hardly in justice to ourselves do otherwise than approve of portions of the interim report of the Commission, since certain of the reforms advocated have over and over again been advanced in these columns. Properly to appreciate the point of view from which the Commission regards our problems, it may be well to recall at the outset the exact nature of the task entrusted to it by the Imperial Government. As set out in the official reference, this was:—

> To inquire into and report upon the natural resources of the Dominion of Canada, the Commonwealth of Australia, the Dominion of New Zealand, the Union of South Africa, and the Colony of Newfoundland; and, further, to report upon the development of such resources, whether attained or attainable upon the facilities which exist or may be created for the production, manufacture, and distribution of all articles of commerce in those parts of the Empire; upon the requirements of each such part and of the United Kingdom in the matter of food and raw materials, and the available sources of such; upon the trade of such part of the Empire with the other parts, with the United Kingdom, and with the rest of the world; upon the extent, if any, to which the mutual trade of the several parts of the Empire has been or is being affected beneficially or otherwise by the laws now in force, other than fiscal laws; and, generally, to suggest any methods, consistent always with the existing fiscal policy of each part of the Empire, by which the trade of each part with the others and with the United Kingdom may be improved and extended.

Armed with so wide a scope for enquiry, and coming fresh to our problems, the Commission was clearly in a position to take a fairly dispassionate view of, and form some valuable, if hasty, conclusions in regard to, the present conduct and future prospects of Rand mining. It may simplify discussion of the recommendations if we subdivide them as referring to (1) Labour, white and black; (2) the duty and responsibility of the Government, and (3) Capital, and the control and organisation of industry on the Rand. In regard to the first-named, it may be said at once that the proximity of the white labour troubles seems unduly to have impressed the Commission. As we pointed out at the time, the fact that the Commission came direct to the Rand at a period of unprecedented labour turmoil, fresh from the calm backwaters of placid Kimberley, was bound to affect its view of the seriousness of the white labour unrest. Seen in the truer perspective of to-day, it seems a little ridiculous to talk of the industry as in danger of being "wrecked by industrial strife." That, however, does not prevent us endorsing the recommendation that the present contract system should be abolished. As a fact, among the leading engineers and managers of the industry the system is losing friends daily, and it seems only a question of time before it disappears altogether. No one, of course, can quarrel with that portion of the report in which it is shown that the problem of efficient working is of vital importance; nor with its corollary that "the present white labour force is discontented and unstable, the miners are largely of low technical skill and in many cases unfitted for positions of authority over natives." Nor are we prepared to deny that "the contract system is largely responsible for this unrest and discontent, which are destructive of the efficient working of the fields as a whole and opposed to any chance of settled conditions." Moreover, we all agree that "only skilled whites of high class and good character should be placed in the control of natives." These things are, after all, the commonplaces of *efficiency* engineering on these fields; and the Dominions Commission is merely repeating them. Where the native question comes to be discussed, moreover, similar counsels of perfection are advanced. We are told, for instance, that the native recruiting system is most undesirable and immensely costly and that free engagement should be encouraged. It is added that the largest possible proportion of the total wages should go to the workers, the least possible proportion to the recruiters and intermediaries. The system of payment is not conducive to efficiency as the industrious and skilful native is not securing adequate encouragement. Moreover, the belief is expressed "that greater efficiency can be attained by improving the opportunities of the native and widening the field of labour"—or, in other words, removing the "Colour Bar." Following all that is best in local opinion, and the views expressed last week by Lord Gladstone, the Commission recommends locations in which natives could live with their families and closed compounds preventing the association of natives with low whites. The presence of vested interests on the Rand should not be allowed to bar this reform. Continuing, the Commission denounces the abuses of the liquor traffic on the mines.

Turning to (2) the duty and responsibility of the Government towards the industry, there is a great deal in what the Commission has to say. It cannot be denied that the attitude of the Government has been merely that of a policeman—"restrictive and negative" in the expressive phrase of the report. That the Government as the holder of four-fifths of the undeveloped areas of the Far East Rand should be content to remain passive and supine has always been held up by us as a national anomaly; and the emphasis laid by the Report on this matter should go far to stimulate the tardy steps now being taken by the Government to open up those areas. When, however the Commission proceeds to advise that the State should adopt an attitude of active interference with the existing organisation of the industry, we are bound to confess we cannot follow its reasoning. It would appear, also, that the Commission took too literally some of the eloquent special pleading in favour of amalgamation of the whole Rand put forward by idealists like Mr. George Nathan. Indeed, the whole of the sweeping general conclusions regarding the Rand are vitiated by the fact that the Commission allowed itself to become palpably infected by the microbe of amalgamation or "Kimberlization" of the whole industry. That attractive but impracticable ideal is plainly at the root of such assertions as: "Unproductive mines increase the labour difficulty and tend to degrade the level of wages and increase the difficulty of finding capital for the development of new areas. It is a fallacy to suppose such mines are equally beneficial to South Africa as paying mines." And again: "The absence of cohesion of groups is so marked that adequate reform from within cannot be expected, so more positive action by the Government—in the absence of pressure by shareholders—and its closer co-operation with the gold mining industry is therefore essential. With a view to attaining this object, the Government should engage as adviser a world-authority on mining matters, assisted by someone versed in labour conditions in other countries and the settlement of labour disputes. Unless reform is undertaken, a great national asset is in danger of being wasted through inefficiency, want of method and central control, wrecked by industrial strife and choked by vested interests and parasitic growths." This is all very beautiful, with the other-worldly beauty of the ideal and the unattainable. Though the Rand can, in the opinion of practical men, hardly yet hope to reform itself up to the ideal that the Commission had at the back of its mind, there is no reason why it should not muddle on to better things. Methods can and are being improved; labour efficiency can and is being increased; and control can be better coordinated without being actually centralized to the point of unity. These fears and recommendations of the Commission, in their necessarily imperfect, because [illegible], form read strangely like an essay on the socialization of all production. "Vested interests" and some industrial friction we cannot hope to eradicate in this imperfect world. The shareholders of a poor mine cannot be expected to be unselfish enough to close it to oblige their richer neighbours, and economic forces operating in a natural manner can be trusted to extract the maximum returns from the mining industry. Wherefore the Rand must be content to welcome what is good in the Dominions Commission Report, and to leave the rest.

THE MONEY OUTLOOK.

THE feature of the past few weeks has been the sudden and wonderful improvement in the money outlook both here and in London, reflected in every department of business in this country. Not for nothing have Rand chairmen recently dilated upon the inherently sound position of the mining industry. Already there has been a remarkable awakening of interest in London to the possibilities of Rand shares, and the market has displayed a better tone and braver temper than for many a long day. Following closely on the lines and on the heels of the speeches at mining company meetings, the chairmen of the big South African banks have been able to tell a consistently cheerful story, and to afford their shareholders and the whole business world tangible and undeniable proofs of increasing prosperity. One immediate effect of all this was the excellent reception given to the latest South African loan of £4,000,000 issued in London during mail week. It is true that the outlook for all markets in Europe is better, and undoubtedly South Africa is to some extent benefiting from the general improvement. Keen observers of events and tendencies on the other side find that the balance of contributing factors is decidedly in favour of the optimists. To begin with those of a favourable character. The crops both in Russia and in the United States promise to be exceedingly good, while, taking those of the world at large, they are not by any means bad. There is every reason to hope, then, that prices of food and material will tend downwards, and that the conditions of the working classes will be improved. Further, the outlook in Mexico appears to have undergone a radical change for the better. And, moreover, there is every reason to believe that markets are entering upon a period of cheap and plentiful money. Turnnow to the adverse influences: There are the inevitable troubles of reorganizing Mexico; the delay of an agreement between the European bankers and the Brazilian Government; a large failure in New York, affording evidence of the shock that has been given to credit, and of the difficulty of getting in money due; the relations between Austria and Servia; the precarious condition of the new Albanian Government; and, lastly, the arming of Orangemen and Nationalists in Ireland. No one who dispassionately weighs the two lists just set out can seriously doubt that the favourable influences are sure to outweigh the unfavourable. If so, credit throughout the United Kingdom will rapidly revive, and it is safe to say that we shall see a distinct improvement upon the Stock Exchange. To our mind the great importance of a revival on the Stock Exchange is not that holders may be able to mark up their shares or that there may be increased speculative activity. To this country of enormous natural resources hungering for the fertilizing stream of capital it means expansion, industrial activity, and, in a word, progress. Speaking the other day at Capetown, before the South African Institute of Bankers, Mr. J. P. Gibson, Deputy General Manager of the Standard Bank, showed that the banking resources, including Fixed and Floating Deposits and Notes, within the Union, in 1908, were £31,900,000, and advances £22,000,000, giving a ratio of 69 per cent., while at the close of last year, five years later, resources had risen to £36,500,000, and advances to £32,500,000, the ratio being then 89 per cent. In the five years, therefore, there has been an increase of £4,600,000 in resources, and £10,500,000 in advances, with a resulting rise in the ratio of 20 per cent. These figures are eloquent, and show that though the Banks have done their utmost to render assistance, and help forward the development of the country they also indicate the great need for more capital. Mr. Gibson also drew attention to the very small amount of new capital that had come to South Africa of late. Figures furnished by the *Economist* show that out of a total of £160,000,000 new capital raised in Great Britain last year for British possessions and foreign countries, only £6,294,700 was for South Africa, while Canada obtained £44,000,000, and Australasia £19,000,000. Surely it ought to be possible to divert to this country a larger share of that fructifying stream. There is reason to hope at any rate that as a result of putting the mines on a sound basis, the wise and careful policy of our banks and the growing recognition oversea of the great possibilities of this country, the credit of South Africa is at last beginning to recover; and that we are on the eve of greater financial and commercial activity.

POSITION OF THE RANDFONTEIN ESTATES.

Rumours Regarding a New Reef—Operations at the "Central" Hampered by Labour Shortage.

Rumour has recently been busy in regard to new reef discoveries on the property of the Randfontein Estates Company, and it has been more particularly stated that a reef has been located on Middelvlei. On inquiry we are informed that these rumous are without foundation. No new reef, according to the Company, has been located, and as to Middelvlei, it is more or less common knowledge that conglomerate beds have been known for several years past to exist there. There are, indeed, old workings on Middelvlei, but we learn that nothing of importance has recently been disclosed on this farm. Reports as to new reef discoveries on Randfontein come forward periodically. In some instances these have been correct, but in others they have, no doubt, originated from the commencement of work on a new section of this large property, and on a reef which has for years past been exploited in other portions.

Numerous Reefs.

Geological conditions at Randfontein vary considerably from those obtaining on the more central portion of the fields. Not only is the dip very much steeper, but there appear to be a greater number of distinct and profitable conglomerate beds than in the areas nearer Johannesburg. For some six or seven miles the Randfontein Leader Reef and other reefs strike in a line north to south along the area of the Randfontein Central Company. The proved, partially developed, and partially producing portion of the large area owned by the Company contains not alone one, but certainly two, and possibly three or even more parallel reefs. It may be of interest to recall that at the Randfontein meeting, in July, 1898, reference was made to the fact of a new reef having been come upon, lying to the westward of the Randfontein Leader Reef, which had been worked. After cross-cutting from the No. 1 to the No. 2 and locating this West Reef, the cross-cut was extended (at a depth of some 500 feet below the surface) westward from No. 2 reef; and some 50 feet distant from No. 2 a third reef was encountered; and again, by borehole tests still further to the west, yet another reef was reported to have been come across. In August, 1907, at Block A, the central portion of Randfontein Central's area, 500 feet east of the Leader Reef, a new (East) reef was discovered in cutting the foundations of the mill, and has been traced a considerable distance north and south of the point of discovery. Later on about a mile north of the first discovery, exploring work resulted in the cutting of an Eastern ore body, about 1,800 feet east of the Leader, and a shaft was sunk to open up the reef.

Crushing Results.

The Randfontein Company's output last month, at £246,695, was £7,583 below that declared in respect of the May operations. On account of labour shortage, from which the Company is still suffering to a considerable degree, it is not at present practicable to run all the 600 stamps in the new Central mill. At present approximately 500 of these are in operation, and as more labour comes forward these will be augmented. The four old mills on North Randfontein, South Randfontein, Porges Randfontein and Robinson Randfontein, each containing 100 stamps, are now being operated, so that the total crushing equipment at work on the property is approximately 900 out of 1,000 stamps. In May 950 stamps and 29 tube mills were operated, and 216,590 tons were put through the mills. Some time ago crushing operations were suspended on Sundays on account of labour shortage, and this of course has affected the tonnage. But it is hoped that before long the Company will be able to employ its full crushing equipment for good running time throughout the month. It is interesting to calculate that on a basis of a ten ton duty, and running 25 days in the month, the Randfontein Company would crush the huge amount of a quarter of a million tons per month. Were sufficient labour available, this might be achieved without great difficulty.

FISSURE COALS OF THE WESTERN PROVINCE.

Question of Working Now Feasible.

"Fissure Coals of the Western Province" was the subject of a paper by Dr. Versfeld, read at the Science Congress at Kimberley last week. This paper gave an account of the very remarkable deposits of secondary coal occurring in beds of the Beaufort series in the districts of Laingsburg, Sutherland, Beaufort West, and Prince Albert. The coal is a very shiny anthracite which, from the nature of its occurrence, obviously occupies a position different from that in which it was first deposited as vegetable matter. The seams vary in inclination from vertical to nearly horizontal. The latter, which were the first discovered, appear to contain coal of so peculiar a nature that so far it has not proved very suitable for ordinary use; the most serious drawback being its tendency to decrepitate, flying into minute fragments when heated. The more recent discoveries, however, have revealed, in the vertical fissures, coal of a very different nature. Fissures have been found up to six feet in width, containing good anthracite coal with very low ash content. A detailed description of the characteristics of the seams is given. These recent discoveries have put a different aspect on the whole proposition. Until lately the question of working fissure coals themselves has not been considered so much as the question of finding the horizontal seams from which they have been derived. It has been generally presumed that these lie on a lower level, and that the coal has been forced up from below by the agency of intrusive dolerite. The author, however, maintains that it is far more likely that the coal has been dropped—or in the case of the nearly horizontal seams partly washed—into the fissures from the formerly overlying beds of the Stormberg series. He bases his assumption on the fact that in the underlying Ecca and Dwyka beds, as well as the still older Cape formation, no coal has hitherto been found in the west and south of the great Karroo, though the outcrops of these beds have been carefully examined at numerous localities between Prieska and Pondoland. On the other hand, the overlying Stormberg beds, or the remains of them that have not been denuded, are known to contain extensive beds of coal. The fact that this coal has a far higher percentage of ash than that in the fissures is by no means inconsistent with the theory put forward, as it is quite unlikely that the nature of the coal should not vary over large areas. There is also evidence of downward motion in the seams. Be the origin what it may, since the coal is there, and the demand for good anthracite is increasing, the question of working these vertical seams for themselves may now be considered, says Dr. Versfeld.

Blaauwbosch Diamonds.

The washing returns for June, 1914, were as follows:—Blue ground washed, 8,27 loads; recovered, 1,630 carats, or 19·69 carats per 100 loads.

PROGRESS OF THE NEUMANN GROUP.

Recent Returns Analysed—The Position of the Wit. Deep—Mine Doing Well in Face of Acute Labour Shortage—Improving Prospects of the Main Reef Group.

Profits of the mines comprising the Neumann Group have shown consistent advance during recent months. The aggregate earning in June was £51,814, which compares with £52,251 in May, £52,427 in April, £50,738 in March and £46,104 in February. Moreover, last month's profit did not include additional earnings of the Cons. Main Reef (£3,666) and Main Reef West (£5,815), resulting from the final clean up of certain plates which will not be required in the new tube mill house. These amounts have not been included to inflate current earnings, but have been treated as special declarations.

THE WIT DEEP.

An important cable has, during the week, been despatched to London in reply to inquiries "regarding the fall in the price of the shares" of the Wit. Deep Company. Wit. Deeps on March 7th last, were quoted at 51s. 9d. On Tuesday morning's High Change there were buyers at 42s., sellers 43s. In the afternoon sales were effected at 44s. In the circular in question the Board of Directors desire to state that the decreased profits obtained for the last three months have been due chiefly to the scarcity of native labour, which was dealt with fully by the chairman at the annual meeting on May 15th, 1914, and to a temporary fall in the value of a number of stope faces which resulted in the grade of the ore milled during May and June falling below the average value of the ore reserves. The company at present has only 53 per cent. of its native labour complement, but it is hoped that this will be steadily increased, whilst an improvement in the grade is expected in August. The average value of the ore reserves at 31st December, 1913, was 6.8 dwts. over 53 inches. During four months, January to April, 142,775 tons were developed, value 6.7 dwts. over 61 inches; in May 28,000 tons, 6.9 dwts. over 55 ins.; and in June 33,700 tons, 6.7 dwts. over 53 inches. It will be seen from the above that the ore reserve position of the mine has been quite maintained in so far as value and width are concerned, whilst any falling off in actual tonnage can scarcely be very large, and is not to be wondered at, considering the shortage of native labour. Examination of the declared profits for the past three months fails, however, to establish any decrease worth speaking of. In point of fact the earning for the last month was in excess of the May amount and was only £228 below the April result.

Profits, etc., for the past four months may be set out in tabular form as under:—

	Tons milled.	Output. £	Profit. £
March	41,100	52,481	20,071
April	41,800	55,781	21,440
May	43,120	57,278	21,018
June	41,080	56,098	21,222

Doubtless some disappointment has been occasioned by the failure of the Company during recent months to record profits as large as those earned last year, when the total profit was £308,228, or an average of over £25,000 per month. In his annual report for the year Mr. D. Wilkinson, the consulting engineer, stated that the outlook at the mine is now more satisfactory than has been the case for the last three years, and "given sufficient native labour, the profits earned during 1914 should be considerably higher than during the past year." The milling capacity of the Company has been brought up to 52,000 tons a month, and there can be no doubt that, were sufficient labour available, the Company could without difficulty reproduce the results secured in 1913, if not improve on them. As it is, with a complement of only 53 per cent. of the requirements of the company, the results recently secured cannot be adjudged unsatisfactory, whilst the good development disclosures officially reported encourage one in the belief that this property will soon return to its former level of prosperity.

THE MAIN REEF MINES.

Two mines that recently have shown conspicuous improvement in profit-earnings are the two Main Reef subsidiaries—Consolidated Main Reef and Main Reef West. Returns for these Companies for the past four months have been as under:—

Consolidated Main Reef.

	Tons milled.	Output. £	Profit. £
March	20,700	31,098	9,615
April...	20,280	31,662	9,744
May	22,000	34,710	10,886
June	24,110	38,370	13,934

Main Reef West.

	Tons milled.	Output. £	Profit. £
March	19,720	21,169	3,046
April	18,090	23,940	4,023
May	19,020	26,165	4,897
June	19,750	26,037	5,055

These Companies operate a joint crushing and treatment plant, and for this a new tube mill plate house has recently been constructed and a portion of the battery plates have been transferred there. From certain plates of the old battery, which will not be required in the new scheme, there has been a final clean up, and had the amounts derived therefrom been added to last month's profits, the Main Reef's earnings would have been £17,600 and that of the Main Reef West £10,928. In both these mines development is proceeding with satisfactory results, and it is particularly encouraging to learn of improved disclosures in the Main Reef West, a property which for so long has been more or less under a cloud.

WOLHUTER.

The Wolhuter continues to earn consistent and satisfactory profits. Development, too, is reported to be good and particularly encouraging at some points. The development in the upper levels of the City Deep Mine, which remains uniformly good, indicates the maintenance of, if not improvement on, present profits when the lowest levels in the Wolhuter Mine are exploited. Returns for the past four months have been as follows:—

	Tons milled.	Output. £	Profit. £
March	34,100	42,177	14,021
April	33,000	41,739	14,220
May	34,100	41,965	14,245
June	32,700	41,031	14,000

KNIGHT CENTRAL.

The Knight Central remains the disappointing member of the group. The profit last month was in the neighbourhood of only 6d. per ton. The future of the property and the value of the ore to the south of the dyke, are, we understand, still largely problematical. Working costs in May were 20s. 8d. per ton, including 1s. 11d. per ton expended on development. Returns for the past four months have been:—

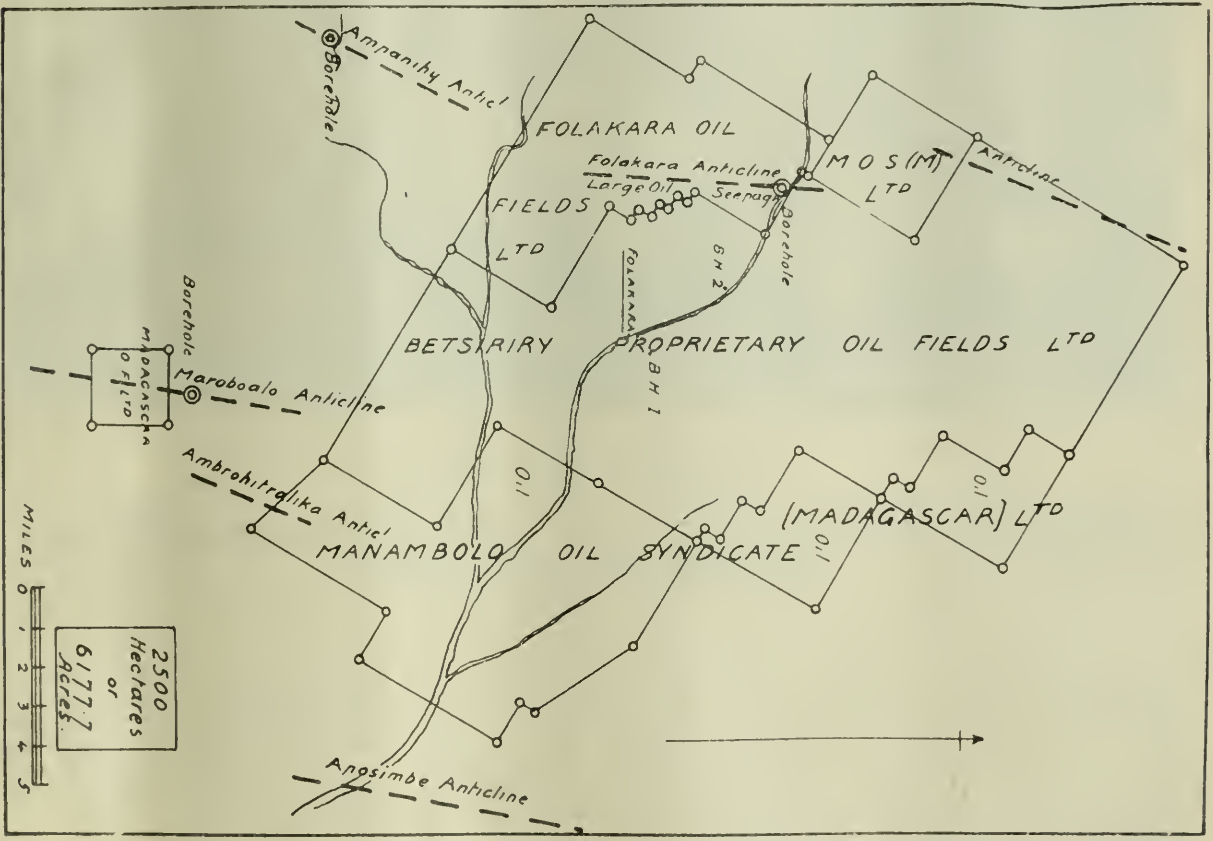
	Tons milled	Output. £	Profit. £
March	21,100	21,463	4,006
April	19,050	22,792	3,000
May	20,500	22,354	1,205
June	21,150	22,620	603

MADAGASCAR OIL FLOTATIONS.

Boring in Progress—Promising Shows of Oil—Extensive Operations Decided On.

The accompanying map shows the areas held by three prominent companies which have recently been formed for the purpose of investigating the oil-producing possibilities of a district which is stated by several prominent engineers to have excellent prospects. The properties lie in the Betsiriry Valley, where Jurassic strata, with a northerly and southerly strike, crop out for many miles. The beds dip towards the west at an easy angle, but anticlines are not uncommon, and the formation, in structural character, resembles some of the large oil-bearing series in the United States and elsewhere, in which the principal feature is a monoclinal dip with subordinate anticlines, or inverted troughs, to put it in a non-technical way. These anticlines are collecting places for oil and gas, and where they exist the prospects of finding petroleum are usually more favourable than elsewhere in a productive field. Several anticlines are shown on the accompanying map, and, as was to be expected, the indications of petroleum are abundant in their neighbourhood. The Folakara and Maroboala anticlines are specially mentioned in this connection by the geologists who have visited the region, although others, particularly the Ambrohitralika anticline, are said to present very favourable conditions. Oil seepages and springs have been located, also, in places where anticlines have not yet been actually surveyed, and generally there is no question as to the highly petroliferous character of the district indicated in our map. The point to be investigated is the matter of the quantity of oil, and active operations under skilled direction have already been commenced.

The Sakalava Madagascar Proprietary Oil Fields, Limited, who own large areas outside and surrounding those marked, are boring on the Maroboala anticline, and their field manager, Mr. S. A. R. Skertchley, has sent very gratifying reports concerning the work begun under his control. A plant capable of boring to 1,500 feet, is in operation at this site. On the Ampanihy anticline, to the west, a 3,000 foot plant is ready for erection at the site indicated, while a plant capable of drilling 1,000 feet is under order for the site on the Folakara anticline. The Manambolo Syndicate propose to start boring operations at as early a date as possible. In addition to having the Ambohitralika anticline, their blocks are admirably situated, according to reports, with regard to the Maroboala anticline, and oil springs and other indications have been met with in several sections, as shown on the map. The borehole No. 1 of the Betsiriry area was the first to be put down on the field. It was located on an anticline, but the results were not satisfactory, although large quantities of gas were tapped. A second borehole, to the north-east, was located on a syncline, and the quantity of oil found was not encouraging, but in a third borehole, still further to the north-east, near the site of the proposed Folakara borehole, a flow of some nine barrels per diem were obtained at 465 feet, and a more fluid oil at 1,150 feet. An inrush of water and want of funds compelled the stoppage of the work. The Manambolo Syndicate are to acquire about 6,000 acres immediately on the line of the Folakara anticline, and considerable attention will doubtless be given to this neighbourhood by each of the three companies.



Map Showing Recent Flotations in the Madagascar Oil Field.

MINERAL PROSPECTS IN SOUTHERN RHODESIA.

An Output Approximating to £4,000,000 Likely for this Year—What the New Producers are Doing—Golden Kopje and Falcon about to Mill.

Month after month the mineral output of Southern Rhodesia shows increase, and it should at this juncture in the industrial history of the territory be worth while again to take stock of the situation and to analyse the positions of the several new mines which have recently commenced production or are about to attain to that stage. In the past twelve months the mineral returns of Matabeleland and Mashonaland have advanced by, roughly, 30 per cent., the aggregate value of the mineral output for May, 1913, being £243,152, and that for May of this year £315,700.

THIS YEAR'S INCREASES.

The most marked advance has been recorded since the commencement of the current year, in consequence of the entry into the productive list of such important concerns as the Shamva, Cam and Motor, Bell and Antelope mines. A comparison between the outputs for January and May of this year yields the following figures:—

January.		May.	
Gold	£249,051	Gold	£290,062
Silver	1,069	Silver	1,028
Lead	349	Lead	226
Chrome Iron	21,281	Chrome Iron	13,475
Coal (sales)	9,882	Coal (sales)	10,215
Asbestos	1,060	Asbestos	—
Diamonds	188	Diamonds	694
Total	£282,880	Total	£315,700

It will be observed that between these two periods the output of gold from the territory has advanced by over 16 per cent. In regard to the variations in the other products, the most noticeable is in chrome iron, which shows a decline of nearly £8,000, but this, it should be explained, is attributable to varying shipping facilities and not to any inherent flaw in the stability of that industry. As a matter of fact, the production of chrome iron is likely to increase in the near future, especially so in view of recent discoveries in the Victoria District. Asbestos, too, may be relied on to show advances. No measure of importance is to be attached to the decline as reflected in the foregoing comparative statistics for January and May. The King's Asbestos property, in the Victoria locality, continues to open up well, and in a few months' time the output from this source should be very substantial. The Wankie Colliery's output shows a small increase in sales between the two periods. The Company has concluded important arrangements with the Union Minière for the supply of coal and coke to the Katanga Copper Industry, and should at least maintain its present selling output. The silver and lead outputs are not likely to show much advance, but copper should shortly reappear in the output list on account of the commencement of productive operations at the Falcon, a large gold-copper mine in the Blinkwater area. As to precious stones, it is encouraging to find that the Somabula Fields are again producing small quantities of diamonds.

NEW GOLD PRODUCERS.

Substantial steady advances continue in the output of gold. This already has attained to the neighbourhood of three and a half millions per annum, thereby placing Southern Rhodesia higher in the list of the principal gold producing countries than ever hitherto, and it is practically certain that within the next six months the rate of output will be over four millions per annum.

RETURNS NOT YET REPRESENTATIVE.

In the past few months the following companies entered the producing list. Their outputs for May are set out hereunder:—

Plant.	Tons treated.	Yield.
Bell Reef—		
Two Ball Mills and 1 Tube Mill ...	2,528	£4,414
Antelope—		
Two Ball Mills, 4 Pans & 1 Tube Mill	3,233	7,680
Cam and Motor—		
Roasting...	11,120	13,958
Shamva—		
56 Nissen Stamps and 8 Tube Mills..	46,730	22,418
		£48,470

The total output of these mines is thus at the rate of nearly £600,000 per annum, but it should be realised that this result has been secured before the various plants have attained to normal running order, and if gold in circulation and absorbed on plates, etc., be taken into consideration, a very much higher output would be arrived at. At the Shamva, for instance, where the tonnage dealt with was 46,730, as compared with 39,012 in April, but the gold won was worth only £22,418, as against the recovery of £27,093 in the previous month, it is explained in an official note that over £8,000 worth of gold was absorbed during the month by new sections of plant brought into commission. The working costs are well within the estimates, while the extraction is better than was anticipated. It only remains then, seeing that the full plant has now been brought into operation, that a grade of ore be sent to the mill which more closely approximates to the average grade of the reserves, in order that anticipations as to the total gold recovery may be fully realised. The figures from the Cam and Motor read: 11,120 tons roasted for a recovery value of £13,958, which show a large decline in both respects when compared with April's figures, and which indicate that operations have needed to be substantially reduced pending the additions and alterations to the plant which have already been notified as necessary. The return from the Antelope Mine last month was worth £7,680, an improvement by £1,560 on that for April. At the Bell Mine also there was an encouraging improvement—£4,414, as compared with £2,929.

TWO OTHER GOLD WINNERS.

The gold output of the country will soon be augmented by outputs from the Golden Kopje Mine in the Lomagundi District, and the Falcon, in the Blinkwater area. Both these properties are under the control of the Gold Fields Rhodesian Development Company. The Golden Kopje is, in fact, due to commence crushing operations this month, whilst at the Falcon Mr. A. J. Brett has been appointed manager, and there have already been satisfactory tried runs of the plant. The Secretary for Mines of Southern Rhodesia has made the cheery forecast of a mineral output for the year worth four millions, and it certainly looks as if this prediction will be very nearly, if not wholly fulfilled, since the value only of the gold recovered during the period to May 31st last, was £1,368,125, as compared with £1,171,867 won in the corresponding five months of 1913. Apart from the new producers, it is satisfactory to learn that, generally speaking, the outlook on the older mines of the country is very good, and that in most districts the small workers are reaping a good harvest during the present winter.

THE ACTING MANAGER AND UNDERGROUND STAFF OF THE VILLAGE DEEP, LTD.

THE PETROLEUM DEPOSITS OF SOUTH AFRICA AND THEIR VALUE TO THE EMPIRE.

[By James Cumming.]

In the House of Commons, on Monday, 29th June, 1914, Sir Edward Grey said, " He regretted that they could not get a supply of oil from the Dominions "! It is my pleasant task to disabuse the mind of the right honourable gentleman of any such erroneous idea, and *inter alia* to give to the whole British Empire, and especially to South Africans, some information upon this, to-day, most vital subject, which shall prove to demonstration that right here, in South Africa, we have an illimitable supply of petroleum for naval, commercial, domestic, and all purposes—available alike in time of either peace or war. The existence of shales throughout South Africa has, of course, been known to everybody for many years, but the knowledge of their commercial value (where found in conjunction with certain geological formations) as most invaluable sources of petroleum, of petrol, of naptha, of pitch, and other products now in world-wide demand, is only beginning to dawn upon investing public and mining world alike. Up to the present, Sir Edward Grey may perhaps have had some grounds for his pessimistic pronouncement, for Great Britain—although possessed of limited sources of supply in Scotland and certain small areas elsewhere within the British Isles—has been compelled to largely depend upon such foreign countries as the United States of America, Mexico and Russia, for even the comparatively small quantities she has hitherto required; but now that the value of petroleum as the most economic form of fuel for both naval and merchant shipping, as well as for railway and industrial motive power, is being so fully demonstrated, and knowing that in the event of war these foreign sources of supply would be wholly insufficient, unreliable, and perhaps non-available, it has become imperatively necessary to discover sources of supply within the borders of British territory. Hitherto South Africa has utterly failed to recognise that she possessed enormous supplies of petroleum-bearing shales, such supplies in fact as would suffice the whole world. Hitherto she has imported every gallon she has required for even mere domestic use, instead of exporting millions of tons annually, in addition to supplying herself. The Union Government has certainly, in a measure, recognised these facts, and last year obtained a report upon the petroleum prospects of South Africa from Mr. E. H. Cunningham Craig, B.A. and F.G.S., who, however, appears to have made only a very cursory and superficial examination into our oil deposits, and whose " report " may be said only to " damn them with faint praise," and it is necessary to South Africa's exporting and industrial welfare to demonstrate the fallacy of Mr. Craig's conclusions. Throughout his report Mr. Craig alludes only to what had already been exposed and to work done anterior to his flying visit, but even he has to admit (see p. 24 of his report) that the presence of sufficient carbonaceous material from which oil can be formed, has been proved in the Transvaal lower strata. On p. 25, too, he admits that " N.E. Natal (which he was unable to visit!) might furnish favourable structures." On p. 26 he remarks that " in the Scottish shale-fields great variations, in quality, are frequent in any seam," and that " South African seams are not likely to be free from similar variations," but stultifies his own theory by adding that " the almost undisturbed state of the strata in South Africa should make the oil-shales free from that source of deterioration. " The thickness of the seam is good throughout the area, and it is likely to persist with little variation over a large extent of ground." This extract is from page 29 of Mr. Cunningham Craig's report, and it refers to the shale found 8 ft. thick on the farm Wonterplaats, in the Utrecht district of Natal. The writer of this memoir was on the farm on the day Mr. Craig made his inspection and accompanied the oil expert in the process of his examination. Mr. Craig says further: "The carbonaceous content is high, but the shale is sandy and micaceous. The streak is brownish-black to brown," which may be attributed to the samples of the top or surface layers at the spot near the shallow shaft, but Mr. Craig never troubled about taking samples from the underlying shales, which have since been proved to be true oil-bearing shales. The fracture of these underlying shales is not earthy and the streak is coal black, not brownish. Below this seam another has been found, and still another on a higher horizon to the one inspected by Mr. Craig, thus making three bands in all aggregating about 20 feet of shales. Let it here be noted that I am only quoting Mr. Cunningham Craig in order to show his contradictions and inconsistencies, and to prove from his own "report" how utterly superficial was the nature of his investigations.

To illustrate the relative values of Transvaal oil shales as compared with those of a company just floated in England, the following figures are instructive:—At Ermelo is a property which yields: Crude petroleum, 36 per cent.; lubricating oil, 38 per cent.; motor spirit, 5 per cent.; pitch, 21 per cent. In the Wakkerstroom district, oil shales are found, of which the following is an analysis: Crude petroleum, 26 per cent.; lubricating oil, 61 per cent.; motor spirit, 6.5 per cent.; coke, 3.5 per cent. The British company alluded to is "The British Isles Producers"—capital, £1,000,000—formed to work various deposits of petroleum, sulphate of ammonia, etc., in Ireland, Scotland, and Dorsetshire, one of which yields as follows: Crude petroleum, 25 per cent., which in its turn yields: Sulphate of ammonia, 34.5 lbs.; motor spirit, 15 gallons; oil fuel, 15 gallons; paraffin wax and pitch, 73 lbs. per ton. The superiority of the two Transvaal yields is obvious. The expression "struck oil" originated in the discovery of petroleum in North America, and as showing the geological similarity between the petroliferous formations there and those in the Wakkerstroom and other districts of South Africa (never visited by Mr. Cunningham Craig) the following extracts from a report by Mr. F. John [illegible], with experience of years in oil in Alberta, Canada, in Montana, Pennsylvania, and California, in the United States, and in Mexico and Burmah, may be quoted:—"Extending through Montana and Alberta, and as far as the Athabasca river, on the eastern side of the Rocky Mountains, is a formation known as the "cretaceous"—the lower stratum of which is oil bearing. Wherever this series is found folded into an anticlinal structure, and where the structural dome is not broken, oil is usually found, excepting where wells were drilled too close to the surface exposures or outcroppings, where asphalt and tar are all that remain of the oil. Natural gas has been found wherever it has been drilled for near the crest of the anticlines in the lower cretaceous formations. All this gas can be used for fuel and lighting purposes." These remarks apply almost exactly to the geological formation of the Transvaal and South-Eastern Africa generally—especially to the country lying in the eastern spurs and foothills of the Drakensberg and other mountain ranges. Note the three points—east of the Rockies as compared with east of the Drakensberg, the "lower stratum of the cretaceous formation," which is identical to the formation in the Wakkerstroom district; and the "anticlinal structure, where the structural dome is not broken," which [illegible] with Mr. Craig's hypothesis that South African oil strata are [illegible]. It may be here mentioned that Mr. Craig admits that, in Scotland, "shales are profitably worked which yield only 20 to 22 gallons of oil per ton and that from 18 to 22 lbs. of ammonium sulphate per ton is considered good." Compare these figures with those quoted above and the comparison is far and away in favour of the Transvaal shales. He also admits that "a 17-inch seam is profitably worked at Broxburn, a 20-inch seam at Addiewell, a 24-inch seam at Oakbank and [illegible] at [illegible]." The comparison is again in favour of South Africa. The present Mexican war (which even up to the present has cost Mexico 5,000,000,000 pesas, and nearly 50,000 dead) was first brought about by American rancour, and petroleum was the cause. In 1903 deposits of oil were discovered. In consequence Mexico soon began to be looked upon as one of the richest countries of the world. A country which produced at its initial stage of oil production 80,000 barrels per day was one to be reckoned with. The Pearson company, whose headquarters are in England, secured the principal concessions, and the Standard Oil Company, whose octopus methods of monopoly are world-famous, naturally roused itself against Mexico, and soon embroiled the United States. How it will all end time alone will show, but it all goes to prove the coming value of oil and the power of oil interests. Again, as further proof of this coming value, it may be mentioned that the British Government has recently invested 2½ millions sterling in the "Venezuelan Oil Concessions" in South America. They have also taken a large interest in the "Anglo-Persian Oil Co." at Maidan-i-Naftun, 170 miles from the Persian Gulf, which property cost Mr. D'Arcy (the prospector) £200,000 in prospecting alone. The late Lord Strathcona—one of the shrewdest business men of recent years—showed his keen intuition as to the coming value of petroleum industry, in ocean and land transport, and in naval warfare, by investing no less than £56,000 in the Anglo-Persian Oil Company, and when he joined this company it was the desire to render service to the British Empire, rather than any mere hope of personal profit, which actuated him. He saw that our safety largely depended upon our future control of petroleum for naval purposes; but of course he also perceived that such a demand as must ensue must mean an enormous output, and profit, even in Persia. The same argument applies with even greater force here in South Africa.

(To be continued.)

Alaska Mexican and Treadwell and United Gold Mining Companies.

Reports for these well known Companies for 1913 are now to hand. They are all under the same control and in charge of Robert A. Kinzie and E. P. Kennedy, general and assistant general superintendents respectively. Results of the three Companies are best shown in tabulated form. -

	Alaska Mexican.	Alaska Treadwell.	Alaska United.
Stamps working	120	540	240
Ore crushed (tons)	227,122	886,057	448,427
Concentrates saved (tons)	4,796	17,603	10,147
Gold by amalgamation (dollars) ..	225,369	1,221,643	552,541
Gold by cyaniding concentrates (dls.)	264,328	1,136,780	491,002
Revenue from all sources (dollars) .	496,007	2,420,015	1,054,018
Operating profit (dollars)	171,797	1,223,438	385,065
Balance from 1912 (dollars) ...	40,000	225,000	70,000
Available for distribution (dollars)	211,797	1,448,438	455,065
Dividends paid (dollars)	180,000	1,000,000	414,460
Depreciation (dollars)	21,552	400.208	30,050
Balance to 1914 (dollars)	10,245	48,230	10,555
Reserve Fund (dollars)	93,909	205,826	201,810
Cash and special fund (cash) (dols.)	—	371,679	—
Supplies (dollars)	—	499,331	—
Costs per ton milled:—			
Mining and development (dollars)	0.9070	0.8271	1.0452
Milling (dollars)	0.2510	0.2476	0.2462
Cyaniding concentrates (dollars) .	0.0923	0.0880	0.0966
Offices at San Francisco, London and Paris (dollars) .. .	0.0260	0.0207	0.0131
Taxes, legal, bullion (dollars)	0.0336	0.0264	0.0291
Operating cost (dollars)	1.3099	1.2098	1.4302
Construction (dollars)	0.0348	0.0435	0.0177
Operating and construction (dollars)	1.3447	1.2533	1.4479
Loss on Dwellings, etc. (dollars)...	0.0829	0.0982	—
Total costs (dollars)	1.4376	1.3515	1.4479
Net profit for 1913 (dollars) ...	0.7564	1.3808	0.8790
Output to date			
Ore treated (tons)	3,820,446	13,867,789	4,827,342
Gold (dollars)	10,438,713	33,964,625	10,121,223
Profit (dollars) .	3,827,923	15,674,258	2,392,370
Dividend paid (dollars) .	3.273,381	13,785,000	1,576,750

FLOTATION OF THE MANAMBOLO OIL SYNDICATE.

Another Madagascar Venture.

In this issue will be found the prospectus of the Manambolo Oil Syndicate (Madagascar), Limited, a company registered in the Cape Province with a capital of £130,000 in 260,000 shares of 10s. each. The company proposes to develop oil properties in Madagascar, and for that purpose eight concessions, comprising in all about 74 square miles, will be acquired from the owners. It is intended to form subsidiary companies, also, as favourable opportunities occur. As will be seen in the prospectus, all the blocks are favourably located with respect to the most promising anticlines so far discovered in the Betsiriry Valley, in which area the oilfields of the country are situated. These are known as the Maraboala and Folakara anticlines, the names having been given to them by Mons. David Levat in his official report to the French Minister of Colonies and to the Governor-General of Madagascar. Mons. Levat considered the Maraboala anticline to offer the most promising indication of petroleum, and Dr. Merensky reported that the seven blocks of the Manambolo Syndicate were excellently situated in regard both to this anticline and to another immediately to the eastwards of it, known as the Ambrohitralika anticline. It is on the former line that the Sakalava Proprietary Oil Fields are now boring, under the direction of Mr. S. A. R. Skertchly, who, as will have been seen in the newspapers lately, has obtained most promising evidence of oil there. In the Folakara anticline, according to Mons. Levat, there is an abundant seepage of oil, and this, he says, "offers the greatest 'probabilities' of success." The anticline enters Block No. 1304 of the Manambolo Oil Syndicate at its north-eastern corner, and Dr. Merensky considers that this block is located on the extension of one of the most promising zones on the fields. The prospects of the syndicate, as will be seen from the prospectus and from the reports referred to therein, are distinctly favourable. We are informed that the Mineral Oils, Limited, of National Bank Chambers, Capetown, have underwritten 20,000 shares of the capital of the Manambolo Syndicate at a commission of 5 per cent., and that in consideration of this they have a call upon a further 20,000 shares at par. The head office of the Syndicate is in Mutual New York Buildings, St. George Street, Capetown. Mr. A. U. Bourne, of 85, Cullinan Buildings, is the representative of the Syndicate in Johannesburg, and applications for shares may be sent to him directly or the Secretary of the Syndicate in Capetown.

INCREASING USE OF ELECTRICITY ON THE RAND.

Important Review by Mr. W. Elsdon-Dew of Local Electrical Progress.

At the Congress of the South African Association for the Advancement of Science at Kimberley last week, Mr. W. Elsdon-Dew gave a valuable compilation of statistics regarding the use of electricity on the Witwatersrand. The record was in tabulated form, and in introducing it Mr. Elsdon-Dew said:—The subject matter which I have the honour to present to this section of the South African Association for the Advancement of Science touches on that branch of science which has made the greatest advance during the last decade. In Dr. Watkins' presidential address last night before the Medical Congress, he gave a most delightful résumé of the advances made in medical science during the last forty years. The statistics compiled by the Institute of Electrical Engineers cover a much shorter period. A few years ago the use of electricity on the Witwatersrand was but a very small proportion of the total power in use. To-day its proportions are enormous, and the actual work being done, and how electricity is doing it, is recognised by the whole world as one of the greatest advances in engineering. South Africa, with its many great attractions and the vastness of its territories, is progressing at a great rate. The span of our life is filled up with so much that has happened in the applications which science has made possible, that I am rather diffident in prophesying still further advances for that branch of scientific engineering to which I have the honour to belong. If you will excuse my doing so, I hope that by prophesying and bringing to your notice the following, it will bear good fruit, and assist those who can assimilate great ideas, and are able to carry these out, to give attention to the point. We all look forward to South Africa's advance in the direction of agriculture. It is fully recognised that South Africa must take up its responsibilities and become a producing country, and help to supply the necessities of life to those other countries that are so thickly populated that there is not enough ground or land to produce these necessities upon. The advancement of science will be able to make South Africa such a country. If I predict that with the electrification of the railways in this country there will follow the supply of cheap power for the use of the farmer, for him to develop his land, assisting him in ploughing his land, supplying him with water, etc., so that he can produce all that a good Providence has made it possible for South Africa, the land of sunshine, to produce for the benefit of mankind. In making this suggestion, and, if I may call it a prophecy, I do so feeling as one who recognises the great influence electric engineering has in achieving the advancement of a country's progress. The speaker then offered explanations of the statistics. He remarked that the generating sets in use, units of 18,000 k.v.h. capacity, were at one time the largest in the world, being only exceeded to-day by larger units in use in America. The figures as to transmission voltage showed that at 80,000 they were approaching the extreme high voltage beyond which they were unable to go, especially in these high altitudes. The statistics relating to the length of transmission lines pointed to the possibility which electrical engineers realised to be within the range of engineering. The utilisation of all the water powers of the country. He referred especially to the Victoria Falls, which would, he hoped, be able some day to give power to all South Africa for its development in agricultural and other directions. The financial proposition seemed quite feasible. The speaker went on to say the load factor on the Witwatersrand was most satisfactory, being on the mines generally between 70 and 80 per cent. They would also see the great advance made regarding surface winders. Concluding, Mr. Elsdon-Dew said the use of compressed air was one of the most important problems on the Witwatersrand. The system of supply there was the most important in the world, and its conception was the first thought of one whose name was well known in Kimberley, Mr. A. M. Robeson. The success and the advance it had given to the cheaper working of the mines was beyond comment. The figure of two and a quarter million tons of compressed air per annum was not of easy comprehension.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of June, 1914:—Tons crushed, 4,025, yielding 2,091 fine ozs.; estimated value of month's output, £8,893; estimated profit for month, £4,977.

Rhodesian Section.

LATEST MINING NEWS.

The Golden Kopje—Rhodesia Chamber of Mines—Susanna Mines—Rhodesia Mines Trust.

The last quarterly report (to March 31st) on operations by the Golden Kopje Proprietary Mines, Ltd., contains the following:—Ore reserves: Golden Kopje Mine—Probable, 210,204 tons; average value, 6·06 dwts.; possible, 11,000 tons, average value, 6·58 dwts. Union Jack Mine—Ore in sight and [illegible], 15,031 tons; average value, 13·13 dwts.; probable, 11,283 tons; average value, 13·61 dwts. During March a certain amount of work has been done on the third level, principally cleaning up and straightening out of the main drives as far as possible by hand. Machines will not be started until May. Construction: Golden Kopje: Headgear—This at the main shaft is nearing completion. Mill—This is nearly complete. Engine room—The building is finished. Tube mills—The third tube is now being put into position. Dorr thickener—The steel work is being erected. Agitators—Pans are erected, gear is being put in. Dorr filter house—Building is going up well. Extractor house—The building is being framed. Union Jack: Headgear and bin—These are nearly completed. Electric winder—This is being erected. The management anticipate that a test of the various sections of the plant will commence at the end of this month, and that the trial run will commence by the middle of July.

* * * *

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of May states, *inter alia*:—The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of March and April, 1914:—

	March	April
Local	10,666	12,515
Portuguese Territory	6,931	6,912
N.W. Rhodesia	1,383	1,335
N.E. Rhodesia	5,595	5,389
Nyasaland	7,175	7,157
Other Sources	852	891
	32,602	37,229

The number employed in April, 1914, shows an increase of 4,457 as compared with the same month of 1913. Increases are from Local, Portuguese Territory, N.W. Rhodesia, and Nyasaland, while N.E. Rhodesia and Other Sources show decreases. The proposed new regulation in regard to poisonous fumes from cyanide plants, has been further considered and experts' opinion taken. The conclusions arrived at by the Committee are that mechanical agitators are not necessary unless there is arsenic or other poisonous matter in the ores, and then only if the process is carried out in a closed or badly ventilated building. The Committee is of opinion that a regulation is not necessary and that a caution to operators is all that is needed. The Committee has been advised that the agreement for the joint carriage of raw gold entered into between the Union Castle Mail Steamship Co., Ltd., the B.S.A. Co., and the Gold Mining Companies of Rhodesia has been signed by the two first named and that the agreement came into operation on the 1st May. Question of prospecting: This matter has had the attention of the Committee and they recommend that in order to increase prospecting in the country more generous terms could be offered by the Chartered Company by way of reduced royalties to induce capital to come into Rhodesia, or better to make a market for the prospector for the sale of promising properties. The Committee is of opinion that the abolition of payment for first inspection will hamper and deter the prospector, for, generally speaking, he is unable to do the 30 feet of work now rendered necessary. Government Notice No. 248 of 1914, Mines and Works Regulations: The Committee is of opinion that this Notice is both unnecessary and unworkable.

* * * *

At the Susanna Mine the seventh level south drive has been extended from 86 ft. to 114 ft., a distance of 28 ft. The average assay value for this distance, unreduced values, is 10·6 dwts. over 20 ins., and the average assay value for the 45 ft. so far driven in the gold shoot is 23 dwts. over 18 ins., this being also calculated unreduced values. 12th level—Spur Reef winze: The average value for the total depth of the winze is 7·9 dwts. over 32·6 ins. unreduced values. The reef latterly exposed has been quite unpayable, the last sample over 50 ins. showing only 0·7 dwt. Long John Claims—Hut site working: The faces of this working were sampled at the end of April, and gave an average of 5 dwts. There is a large tonnage of this grade ore available, but any estimate of actual tonnage is out of the question. Viola Block: Some good values have been obtained from the surface of the shaft sunk on this block, and further prospecting is proceeding.

* * * *

The newly-formed Prospectors' Society, at Shagari, held a further meeting on the 5th inst., at which there was a good attendance and a number of matters affecting their interests were discussed. It transpired that the Society had written to the Rhodesian Small Workers' Association notifying their existence and soliciting the support of that body. The position at Shagari is that there are a large number of blocks of claims that the prospectors have carried to a certain stage, but for want of means they are at present obliged to "sit on" them. The object of the new Society is to work up interest on their behalf. Mr. R. H. Murray, the consulting engineer, is going to spend a week or so on the most promising of the claims to inspect and report, with the idea of aiding the object in view.

* * * *

The last Rhodesian *Government Gazette* contains the following: It is ordered that a rule nisi do issue, calling upon all persons interested to show cause, on Thursday, the 16th day of July next ensuing, at Salisbury, at 10 a.m., why the appointment of the petitioner, James Thomas Bedborough, as the liquidator in England of the Rhodesia Mines Trust, Ltd., in voluntary liquidation, shall not be recognised, and why he shall not be empowered to administer the assets of the Rhodesia Mines Trust, Ltd., situate in Southern Rhodesia, by himself or his duly authorised agents, James Gordon McDonald and George Mitchell, both of Bulawayo, and to pass transfer of same to the purchaser in accordance with the law of Southern Rhodesia; and further, why all moneys derived from such administration shall not be transferred to England for administration by the liquidator there.

Rezende Mines.

The results for the month of June, 1914, were as follows:—Central Section, £2,061; Old West Working and Penhalonga Sections, £913; total, £3,004.

THE JUNE GOLD OUTPUT IN DETAIL.

Good Figures for Short Month—Some Notable Improvements.

As briefly stated in our last issue, the gold output for June was declared by the Chamber of Mines as follows:—

Total output	717,926 ozs.
Value	£3,049,558
Decrease	2,303 ozs.
Value	£9,782
Witwatersrand	688,232 ozs.
Value	£2,923,425
Decrease	1,027 ozs.
Value	£4,364
Outside Districts	29,694 ozs.
Value	£126,133
Decrease	1,276 ozs.
Value	£5,418
Total Stamps	9,803
Increase	30
Witwatersrand	9,265
Increase	45
Outside Districts	538
Decrease	15

Although under the output for May—June having one day's less production—the decrease is almost negligible, being for the Transvaal 2,303 ozs., valued at £9,782. For the Witwatersrand the decrease was only 1,027 ozs., valued at £4,364. The principal decrease was in the outside districts, which, compared with May, returned 1,276 less ounces, of a value of £5,418.

GROUP PROFITS.

The aggregate working profits of the producing mines of the various groups for June are as under:—

	April.	May.	June.
Central Mining	£238,501	£240,581	£239,717
Rand Mines	215,480	231,378	229,090
Barnato	101,193	110,139	115,230
Robinson	86,310	89,126	86,279
E.R.P.M.	63,983	69,917	73,892
Gold Fields	64,690	70,736	71,849
Albu	61,719	68,785	67,636
Neumann	52,427	52,251	54,814
Cons. Mines Selection ...	18,194	23,184	25,690
New Kleinfontein ...	22,545	23,313	23,079
Goerz	9,683	10,894	11,036

PROGRESSIVE OUTPUT.

The monthly yields since January of last year have been as follows:—

1913.	Ozs.	£
January	789,380	3,353,116
February	734,122	3,118,352
March	790,552	3,358,050
April	784,974	3,334,358
May	794,366	3,373,998
June	747,077	3,173,382
July	653,389	2,783,917
August	728,096	3,092,754
September	706,186	2,999,686
October	718,431	3,051,705
November	673,486	2,860,788
December	672,815	2,857,938
1914.		
January	651,753	2,768,170
February	626,261	2,660,186
March	686,801	2,917,346
April . .	688,877	2,904,924
May	720,229	3,069,540
June ...	717,926	3,049,558

THE LABOUR POSITION.

Month.	Total Natives.	Total Labourers on Gold Mines.	Increase or Decrease on Gold Mines.
1913.			
January	222,791	200,090	+ 8,744
February	230,457	207,662	+ 7,572
March	231,783	207,733	+ 71
April	230,103	205,424	− 2,309
May	222,051	179,644	− 7,780
June	211,808	188,094	− 9,550
July	193,023	170,242	−17,852
August	180,631	158,223	−12,019
September	174,391	152,637	− 5,586
October	170,971	148,782	− 3,755
November	169,535	147,569	− 1,313
December	171,339	150,012	+ 2,443
1914.			
January	175,652	154,202	+ 4,190
February	179,447	157,673	+ 3,471
March	185,824	162,815	+ 5,142
April	188,780	166,003	+ 2,190
May	189,336	165,433	+ 428
June	188,946	166,248	+ 815

INCREASES AND DECREASES.

The Witwatersrand.

	May.	June.	Increase.	Decrease
	£	£	£	£
Aurora West United	18,167	17.717	—	450
Bantjes Consolidated	26,859	28,689	1.830	—
Brakpan Mines .	72,708	74,930	2,222	—
City and Suburban	52,952	49,779	—	3,173
City Deep	86,624	82,865	—	3.759
Consolidated Langlaagte	65,479	66.940	1,461	—
Consolidated Main Reef ..	35,061	38,879	3.818	—
Crown Mines	268,491	267,327	—	1,164
Durban Roodepoort .	15,041	15.016	—	25
Durban Roodepoort Deep	39,066	39,975	909	—
East Rand Proprietary Mines	224,318	232,852	8.534	—
Ferreira Deep	113,134	107,039	—	6.095
Geduld Proprietary Mines	31.067	30.584	—	1,185
Geldenhuis Deep .	70.504	72,016	1,512	—
Ginsberg	16.982	16.757	—	225
Glencairn Main Reef	15,691	15.751	60	—
Knight Central ..	22,628	22,900	272	—
Knights Deep . ..	77,423	72,793	—	4.630
Langlaagte Estate .	62,803	60.623	—	2.180
Luipaardsvlei Estate	19,289	19,514	225	—
Main Reef West .	26,451	25,355	—	85
May Consolidated	9,672	9,705	34	—
Meyer and Charlton	35,027	35.651	624	
Modderfontein B. .	63,363	63,206	—	157
New Goch .	32,686	31,442	—	1.244
New Heriot . .	24.220	25,006	786	—
New Kleinfontein	70,117	69,548	—	569
New Modderfontein	90.400	97.999	7.599	—
New Primrose	25,988	27.113	1.125	—
New Rietfontein Estate	7.094	7,234	140	—
New Unified	14,340	14,455	115	—
Nourse Mines .	62.913	70,368	7.455	—
Princess Estate	29,127	27,815		1.312
Randfontein Central	254.278	246.695	—	7.583
Robinson	92.262	83.469		8.793
Robinson Deep	66.787	69.527	2.740	—
Roodepoort United Main Reef	23,239	28.710	5.471	
Rose Deep	83.464	77.219	—	6.245
Simmer and Jack	59.776	57.574	—	2 202
Simmer Deep .	43,654	44,699	1,045	—
Spes Bona Tribute .	5,811	5,892	81	—
Van Ryn Deep	69,535	70,585	1,050	—
Van Ryn Gold Mines	53,581	50,340	-	3.241
Village Deep ..	74,701	75,419	718	—
Village Main Reef	62,769	59.235	.	3.534
Vogelstruis Estates .	15.164	13.958	—	1 206
West Rand Central	4,001	3.857	—	144
West Rand Consolidated	34,020	31.717	—	2.303
Witwatersrand	50,463	50,909	446	—
Witwatersrand Deep	57,871	57,026	—	845
Wolhuter	42,448	41,534	—	914
Miscellaneous producers	7,568	6.551	—	1,017

[illegible] D[illegible]ctions.

Consolidated Main Reef	3,70[illegible] increase
Main Reef West	5,925 increase

Outside Districts.

	May	June	Increase	Decrease
	£	£	£	£
Barrett	1,138	1,287	149	—
Ceylon Lydenburg	1,066	1,049	—	17
Glynn's Lydenburg	8,920	8,882	—	38
Nigel	19,327	17,756	—	1,571
Quest	3,080	2,867	—	213
Sheba	14,001	13,954	—	47
Sub Nigel	9,506	8,610	—	[illegible]
Transvaal Gold Mining Estates	39,032	43,437	4,405	—
Worcester Exploration	4,672	4,604	—	68
Miscellaneous producers	30,809	23,687	—	7,122

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

The Witwatersrand.

Company.	Tons Milled.	No. of Stamps.	Tube Mills.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	14,540	[illegible]	—	4,171	17,717
Benoni Consolidated	22,000	100	3	6,754	28,687
Brakpan Mines	54,150	140	9	17,640	74,930
City Deep	41,200	150	8	19,508	82,865
City and Suburban	23,100	155	2	11,719	49,779
Consolidated Langlaagte Mines	52,700	100	1[illegible]	15,759	66,940
Consolidated Main Reef	24,110	110	3	9,153	38,879
Crown Mines	206,000	660	24	62,934	267,327
Durban Roodepoort	14,022	90	1	3,535	15,016
Durban Roodepoort Deep	26,420	100	3	9,411	39,975
East Rand Proprietary Mines	161,500	820	25	54,818	232,852
Ferreira Deep	61,400	280	7	25,199	107,0[illegible]
Geldenhuis Deep	52,000	300	7	16,954	72,016
Ginsberg	14,932	75	1	3,945	16,757
Glencairn Main Reef	29,925	160		3,708	15,751
Geduld Proprietary Mines	19,430	50	5	7,20[illegible]	30,584
Knights Deep	65,100	400	11	17,137	72,7[illegible]3
Knights Central	21,150	90	3	5,391	22,[illegible]
Langlaagte Estate	49,575	200	5	14,272	60,623
Luipaardsvlei Estate	17,[illegible]	60	3	4,[illegible]	19,511
Main Reef West	19,780	100	3	6,207	26,366
May Consolidated	14,000	100	—	2,285	9,706
Meyer and Charlton	14,700	75	2	8,393	35,651
Modderfontein B	34,2[illegible]	[illegible]	5	14,[illegible]	63,2[illegible]
New Goch	29,200	120	4	7,402	31,442
New Heriot	13,200	70	1	5,887	25,006
New Kleinfontein	50,150	200	4	16,373	69,548
New Modderfontein	51,500	180	7	23,071	97,999
New Primrose	23,300	155	2	6,383	27,113
New Rietfontein Estate	6,959	110	—	1,703	7,234
New Unified	12,910	60	1	3,403	14,455
Nourse Mines	51,400	260	7	16,566	70,368
Princess Estate	21,300	60	5	6,548	27,815
Robinson	51,400	250	6	19,655	83,489
Robinson Deep	50,330	130	10	16,368	69,527
Randfontein Central	211,223	950	29	58,077	246,695
Roodepoort United Main Reef	30,012	70	4	6,759	28,710
Rose Deep	61,500	300	7	18,179	77,219
Simmer Deep	49,400	180	9	10,523	44,699
Simmer and Jack	53,500	320	7	13,554	57,574
Spes Bona Tribute	6,450	40	—	1,387	5,892
Van Ryn Deep	42,626	80	8	16,617	70,585
Van Ryn Gold Mines	38,200	140	6	11,851	50,340
Village Deep	51,800	180	7	17,755	75,419
Village Main Reef	32,300	160	4	13,945	59,235
Vogelstruis Estates	12,284	70	—	3,286	13,958
West Rand Central	2,468	20	1	908	3,857
West Rand Consolidated	26,300	100	4	7,467	31,717
Witwatersrand	41,820	210	4	11,985	50,909
Witwatersrand Deep	44,680	245	5	13,425	57,026
Wolhuter	32,700	120	4	9,778	41,534
Miscellaneous producers	—	—	—	—	6,551

Outside Districts.

Company.	Tons Milled.	No. of Stamps.	Tube Mills.	Total Gold obtained. Fine Ozs.	Total value.
HEIDELBERG—					
Nigel	11,000	75	1	4,180	17,756
Sub Nigel	4,700	25	1	2,027	8,610
BARBERTON—					
Barrett	—	—	—	303	1,287
Sheba	6,520	60	—	3,285	13,954
Worcester Exploration	6,150	40	2	1,084	4,604
LYDENBURG—					
Ceylon Lydenburg	612	5	—	217	1,049
Glynn's Lydenburg	4,025	20	1	2,091	8,882
Transvaal Gold Mining Estates	14,490	75	3	10,226	43,437
KLERKSDORP—					
Quest	4,513	35	—	675	2,867
Miscellaneous producers	—	—	—	—	23,687

CORRESPONDENCE AND DISCUSSION.

Progress of Folakara Oil.

To the Editor, *South African Mining Journal.*

Sir,—By mail just in from Madagascar we have received the following first impressions of the field from Mr. S. A. B. [illegible], M.Inst.M.M., M.I.E.E., the resident engineer and geologist. Referring to the present drilling site on the Marohmolo Oil Field, he states *inter alia*:—"I have not yet finished my preliminary study of the geology of this section. So far as I have gone, however, I must say that it presents many very promising features. An important discovery, which seems to have escaped the notice of other geologists, is that several mud volcanoes are to be seen here. None of them are in activity, but upon opening one of them I found abundant evidence regarding their nature in the way of inspissated petroleum, etc., etc. The one opened measures some twelve feet in height. These vents of gas constitute very valuable indications on many of the important oilfields.

Shooting the Well.—It is not probable that any 'shooting the wells' will have to be done here, as it is a virgin field where gas pressure may be expected, and the probabilities are that the difficulty will be to get the wells under control rather than to increase their production. I have ordered further casing heads from London for this purpose. No. 1 well.—I inspected this upon my arrival and found it had been lost. The eight inch casing had stuck fast and could neither be drawn or otherwise satisfactorily dealt with. I extracted all the 10in. and 6in. casing. Eighty feet of 8in. casing was left at the bottom as it could not be withdrawn. Upon drawing the casing it was noted that at about 100 feet an oil sand, carrying a small quantity of heavy black oil, had been drilled through. Regarding the second oil sand supposed to have been cut deeper in the well, nothing could be discovered, as the well is full of water and the casing, which remains, prevents any further investigation. I have plugged this hole. No. 2 well (Marohmolo Oil Fields) has been started within a few feet of number one well."

As the above is of great interest to many of the reading public (we have some 3,000 shareholders), we should ask you to kindly insert in your next issue. I am, etc.,

C. W. HEROLD, Secretary.

Roberts Victor Diamonds.

The following are the results of operations of this mine for the month of June, 1914:—Washed 16,386 loads, yielding 3,331¼ carats."

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THE WEEK IN THE SHAREMARKET.

Still Improving—Specialities Higher—Promising Outlook.

The improvement in the market still continues, and the outlook looks unusually promising. London and Paris are again taking an interest in the Rand, and the bargains in our market are being quietly picked up. The industry, as a fact, never was in a sounder position; and it only requires the stimulus of cheaper money in London and absence of disquieting political factors to bring about an accession of activity. The feature of the week has been Modder Deeps, and they register a very substantial rise. State Mines have also been in increased favour, and all the Modder group of mines have been in the forefront. Tins have seen some business, but diamonds remain quiet pending some material results of the recent Conference. The whole tone of the market is decidedly on the mend.

	* Fri. 10th.	* Sat. 11th.	* Mon. 13th.	* Tues 14th.	Wed. 15th.	Thur. 16th.
Adair-Ushers	0 5*	0 5*	0 5*	—	0 5*	0 5*
African Farms	11 9	11 2	11 3	11 3*	11 6	11 6
Apex Mines	17 6*	17 0*	17 0*	17 0*	17 0*	17 6*
Aurora Wests	—	8 9*	—	8 9*	—	8 9*
Bantjes Cons.	14 6	14 6†	13 6*	13 0*	14 0†	13 3*
Blaauwbosch Dias.	—	—	—	84 0*	—	—
Brakpan Mines	—	52 0†	—	—	—	—
Breyten Colls.	25 0*	24 6*	24 6*	25 0*	—	25 0*
Bushveld Tins	—	0 7†	—	0 7†	0 6†	0 6
Cinderella Cons.	—	—	—	—	6 0*	—
City and Suburbans	47 3*	47 0*	47 6*	47 6*	48 3*	48 3*
City Deeps	64 0*	—	64 0*	63 0*	64 0	65 0†
Cloverfield Mines	4 8*	4 6	—	4 5*	4 6*	4 6*
Clydesdale Colls.	9 0*	9 0*	9 0*	9 0*	9 0*	9 9*
Con. Langlaagtes	—	31 6*	—	31 6*	—	—
Con. Main Reefs	18 3*	18 3†	18 0*	18 3	18 0*	18 3
Con. Mines Selection	—	10 0†	—	10 0†	8 0*	—
Coronation Freeholds	—	0 3*	0 3*	0 3*	0 3*	—
Coronation Sydnicates	—	—	—	—	3 0*	3 0*
Crown Diamonds	—	—	2 3*	2 3*	—	—
Durban Roodepoorts.	—	—	17 0*	17 6*	—	17 6*
Durban Rood. Dps	—	17 9*	17 3*	17 9*	17 9*	—
East Rand Centrals	2 0*	1 10*	1 10*	1 11*	—	2 1*
East Rand Coals	1 7*	1 7*	1 7*	1 7*	1 7*	1 7*
East Rand Deeps	1 8*	1 6*	1 6*	1 6*	1 7*	1 7*
East Rand Props.	34 0*	33 0*	33 0*	34 0*	34 0*	35 0*
Eastern Golds	1 2*	1 1*	1 1*	1 0*	1 1*	1 2*
Frank Smiths	3 2*	3 0*	3 0*	3 0*	3 0	3 0
Geduld Props.	26 0*	25 3	25 0*	25 0*	25 3	25 9
Glencoe Colls.	6 3*	—	6 3*	6 3*	—	—
Glynn's Lydenburgs.	11 0*	11 0*	—	—	11 0*	—
Govt. Areas	24 9	24 0	24 3	24 3	24 3	24 9
Joh. Bd. of Ex.	23 6†	23 6†	23 6	—	24 0†	24 0†
Jumpers	—	4 6*	—	—	4 0†	4 0†
Jupiters	5 0	—	4 6*	4 9*	4 9*	4 9*
Kaalfonteins	0 3*	0 3*	—	—	0 3*	—
Kleinfontein Ests.	20 0†	—	—	20 0†	20 0†	—
Klerksdorp Props.	2 8	2 8*	2 7*	2 8*	2 8*	—
Klerksdorps (new)	—	—	—	—	—	2 3*
Knight Centrals	7 9	7 6	7 3	7 3*	7 3*	7 0*
Lace Props.	3 8*	4 0†	3 6*	3 4*	3 7	3 7
Luipaardsvlei Est.	11 6†	11 3†	—	—	11 0†	11 0*
Lyd. Gold Farms	3 0	3 0*	3 0*	3 1*	3 1	3 1*
Main Reef Wests	7 8*	7 6*	7 6*	7 6*	7 9	7 10*
M.R. West Debs.	—	—	£72½*	—	—	—
Meyer & Charltons	113 0*	113 0*	113 0*	115 0*	—	113 0*
Middelvlei Estates	1 4*	1 6†	1 4*	1 6†	1 4*	1 4*
Modder B.'s.	86 0*	86 0*	86 0*	86 0*	—	—
Modder Deeps	59 6	57 9	58 0*	58 0*	60 6	62 3
Natal Navig. Colls.	—	—	—	—	—	15 0*
National Banks	—	—	—	250 0*	—	—
New Boksburgs	1 0	—	0 10*	0 10*	0 10*	0 10*
New Elands	22 0*	22 0*	22 6*	22 6*	22 6*	22 6*
New Era Cons.	6 1*	5 11*	5 9*	5 10*	5 10*	5 10*
New Geduld Deeps.	2 2	2 0*	2 0*	2 1*	2 2*	2 1*
New Gochs	16 3*	16 3*	16 3*	16 3*	16 3*	16 3*
New Heriots	62 0*	—	60 0*	60 0*	63 9*	—
New Kleinfonteins	24 9	24 6	23 9*	23 9*	24 3	24 6
New Rietfonteins	4 3	3 10*	—	3 6	3 9*	3 9*
New Unifieds	—	—	15 0*	16 0*	16 0*	—
Orange Diamonds	1 1*	1 0	1 0*	1 0*	1 0*	1 0*
Pigg's Peak	—	—	—	—	9 9*	9 9*
Pretoria Cements	43 0†	41 9*	41 0*	41 6*	41 6*	41 6*
Princess Estates	5 6*	6 3†	5 9*	5 9	5 9*	5 6*
Rand Klips	3 0*	3 0*	3 0	3 2	3 1*	3 1*
Rand Nucleus	1 10*	1 9*	1 9	1 9*	1 9*	1 9*
Randfontein Deeps	3 11*	3 9*	3 9*	3 9*	3 9*	3 9*
Randfontein Est.	21 9	20 9*	20 0*	20 3*	20 6*	21 0*
Robinson Deeps	29 0*	—	29 6†	—	—	—
Rooibergs.	22 6	21 6*	21 0*	22 6*	23 0	22 6*
Roodepoort Uniteds	—	8 0†	—	—	—	—
Ryan Nigels	—	3 0*	—	—	3 0*	3 0*
Shebas	4 3*	—	4 3*	4 3*	4 3*	4 6†
Simmer Deeps	1 9*	1 9*	1 9*	1 9*	—	1 10*
S.A. Lands	3 1	2 10*	2 10*	2 10*	2 11*	2 11*
Springs Mines	14 0	13 9	13 3*	13 6*	14 0*	14 6*
Sub-Nigels	10 6	11 0†	10 0*	10 0*	10 3*	10 3*
Swaziland Tins	27 6†	—	27 6†	—	27 6†	—
Trans. Coal Trusts	31 6*	—	30 6*	—	30 6*	31 0*
Trans. Con. Lands	19 0*	—	19 0*	19 0*	—	—
Trans. G.M. Estates	—	—	40 0*	40 0*	—	—
Tudors	—	—	2 0†	1 0*	—	1 0*
Van Ryn Deeps	45 3	44 9*	44 3*	45 0*	45 6	45 9
Van Ryn Estates.	—	—	57 6*	—	—	—
Village Deeps	39 3*	39 6†	38 6*	38 6*	38 9*	38 9*
Village Main Reefs	32 6*	32 6*	32 6*	—	—	32 0*
West Rand Cons.	—	8 6*	7 9	—	—	—
Witbank Collieries	43 0*	—	43 6*	42 6*	43 0*	43 0*
Witwatersrands	66 0*	—	65 0*	66 0	66 0	65 0
Wit. Deeps	44 6*	44 0†	41 0*	42 0*	44 6	46 0
Wolhuters	15 6	14 9*	15 0	14 9*	15 3	15 0*
Zaaiplaats	26 9	26 0*	25 6*	25 9*	26 3	25 0*

*Buyers. †Sellers.

Messina Copper.

A more than ordinary measure of interest attaches to the Messina (Transvaal) Development Company at the present moment on account of the unfortunate extent to which that Company is involved in the firm of Milne, Grenfell and Company, and the Canadian Agency Trust. What portion of the £183,000 loaned to the latter Company is recoverable is difficult to say, but as the mine is at present earning profits of about £100,000 per annum, it will be clear that the loan represents almost two years' earnings. The bright feature of the whole business is the excellent manner in which the copper property of the Company, on the Limpopo, continues to open up and to produce large quantities of high-grade copper ore. During June the mill ran 25.35 days and treated 6,772 tons of ore, equal to 267 tons per day. 1,048 tons of middlings were reground, 348 tons being current product and 700 tons from old dump. The total ore and middling treated was 7,820 tons. The smelting furnaces ran continuously during the month and treated 623 tons of middling. The total production was as follows:—Mill concentrate, 1,129.33 tons, average assay value 38 per cent copper; smelter matte, 120 tons, average assay value 54.2 per cent. copper; total, 1,249.33 tons, average assay value 39.5 per cent. copper. Seven hundred tons of middling were recovered after treatment, of a value of 5 per cent. The Lilliput Coal Mine produced 371 tons of coal. Development footage for the month amounted to 383 feet. At the 5th level a cross-cut north at 8 feet from level cut into quartz and glance, and a sample from this gave 10.2 per cent. over 5 feet. The lode struck is similar to that encountered in the big chamber at No. 4 level. At the 6th level a rise is going up and has been advanced 47 feet, and for 30 feet up the average value was 5.7 per cent. over 5 feet width. At the 9th level a drive on the hanging wall of the Bonanza lode gave 6.3 per cent. for 15 feet. At the 10th level a drive west on the footwall portion of the Bonanza lode gave 6.2 per cent. for a distance of 45 feet.

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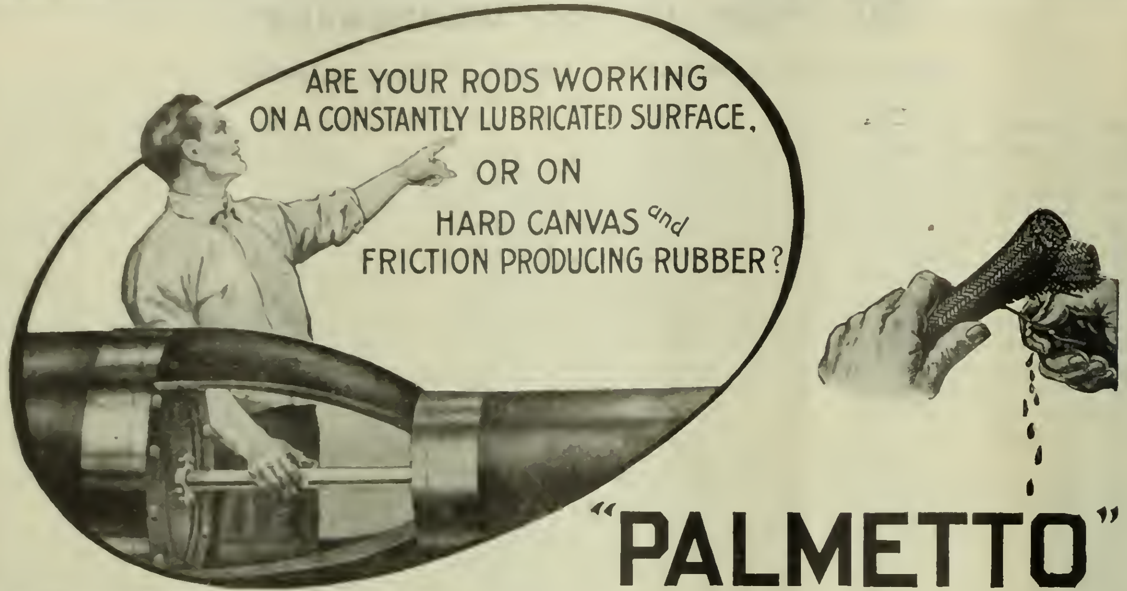
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Engineering Notes and News.

Altitude and Cyanide Works.

On account of the height of the Rand above sea level, an article appearing in the *Mining and Scientific Press*, of Chicago, to hand by this mail, entitled "Pressure and Vacuum at Altitude," by A. W. Allen, should be of considerable local interest. We on the Rand are perhaps apt to lay too many grievances at the door of altitude, but it is, of course, an elementary fact that altitude is a factor of great importance in relation to mechanics. Mr. Allen in his article deals specially with machines used in cyaniding work, and points out that the elevation of the plant above sea level must be taken into account when estimating the possible duty of a number of machines in cyanide practice.

In pumping solids in water, or other diluent, an allowance must be made in proportion to the specific gravity of the mixture. The actual possible lift is also influenced by the class of pump erected, the care with which the joints have been made in the suction pipe, and a number of other considerations. For each 1,000 ft. of elevation a deduction should be made roughly equivalent to one-thirtieth of the vacuum obtainable by the same type of pump at sea-level. In vacuum filtration at high altitudes the initial vacuum may be sufficient, but the capacity of the filter will rapidly decrease as the pores of the canvas become clogged; and the necessity for frequent treatment or replacement of the material will become apparent. Expensive and difficult transport may involve a prohibitive cost for the acid cleaning of the cloth. In the latter event, the adoption of a system of pressure filtration should be considered. The air lift, when properly constructed and operated, may be considered as an ideal expansion engine. The air, at the conclusion of the work, should escape at little above the pressure of the surrounding atmosphere. It follows, therefore, that the extra cost of air compression at an altitude is, in this system of pumping, balanced by the increased expansibility of the air when compressed. Air-lift operations at high altitudes are therefore as economical as at sea level. In the Frenier pump the air is compressed during the revolution of the spiral; and, since the height of lift is practically dependent on air pressure, it follows that this type of pump is affected by altitude in the same way as the compressor. If sea-level results are expected at an altitude, a spiral of large diameter must be used. The makers suggest a deduction of four inches from the sea-level lift for each 100 ft. of elevation when spirals of the same size are under consideration.

Head Wrightson.

A remarkable improvement is shown by Head Wrightson & Co., Ltd., the well-known contractors and engineers. Last year the ordinary shareholders again received a dividend, 4 per cent. being paid, and this is now increased to 7½ per cent. For the year ended 30th April last the gross profits amounted to £60,100, as compared with £36,600 in 1912-13, and in addition to the increased distribution special appropriations are advanced from £9,000 to £25,200, £10,000 being placed to the reserve account for general purposes, £10,000 to depreciation of capital expenditure and £5,200 written off patents account, thus extinguishing that item. The amount of work in progress is not so large as it was a year ago, but some slackening off is only to be anticipated in view of the general reaction in trade.

A demonstration of the possibility of steam raising by the combustion of liquid fuel directly in contact with water has been made in Bremen, Germany. An apparatus consisting of a cylindrical boiler, provided with a number of pockets isolated and drained by suitable valves and drain cocks, was used. Each of these pockets contain an oil-burner, with a pilot burner, by means of which the main burner can at starting be sufficiently heated to effect complete combustion of the oil. When the main burners are well alight, water from the boiler is permitted to flow into the previously drained pockets, and the circulation of heated water commences, the products of combustion as well as the steam generated being used as a source of power in a steam engine. —"The Engineer."

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A DECADE OF METALLURGICAL PROGRESS ON THE RAND.

Points from Presidential Address by Prof. G. H. Stanley at Kimberley.

In Section B of the Twelfth Annual Congress of the South African Association for the Advancement of Science, proceedings opened with the presidential address of Professor G. H. Stanley, A.R.S.M., M.I.M.E., M.I.M.M., F.I.C. The subject was "A Decade of Metallurgical Progress on the Witwatersrand," and the lecture was delivered with lantern slide illustrations. Professor Stanley pointed out that within the previous fifteen years as much gold had been produced as in the whole of the previous history of the world, and this, he said, had been largely due to improved and cheaper methods brought about by men trained in the application of fundamental sciences by suitable education. Short as ten years was in the records of metallurgy, one of the oldest of the technologies, great advance had been made in that time, chiefly in improving methods of carrying out the various stages of the extraction processes, for the outline was still very much the same. In the first place, sorting tables had given way in new plants to travelling belts, which at the same time acted as elevators, and reciprocating jaw-breakers were generally preferred to those of the gyratory type. The weight of stamps had largely increased—in one plant up to 2,000 lbs.—and instead of being used for the complete crushing of the ore as previously, they were only used to crush it coarsely, the screens having now from eight to three holes per linear inch, and stamp duty thereby increased to 20 tons per day. The further reduction to the required fineness is now performed by tube mills, capable of passing 350 to 400 tons per day, and of that up to 110 tons being ground so fine as to pass a screen with ·006 in. holes. Amalgamation was carried out by flowing the tube mill product over stationary amalgamated plates, shaking plates having been discarded. On account of the much finer grinding produced by tube milling, there was now more slime than sand produced, and while slime was once the bugbear of the metallurgist, being untreatable, now it was treated more cheaply than sand. Classification had greatly improved, and in consequence of this and finer grinding, the sand residue, after cyaniding, often contained only about ·2 dwt. of gold per ton. Sand treatment vats had increased in size, till in one plant vats 50 feet in diameter by 12 feet deep were used, sand being collected in one set of vats and transferred for treatment to another set by means of mechanical excavators, belts, and mechanical charging and aerating apparatus. For slime treatment, decantation was not yet ousted by filtering methods, and in one plant vats 70 feet in diameter by 17 feet 6 inches deep were used. Nevertheless, some plants were using filters, the "Butters" being the type employed. Though more costly in operation, they gave a higher extraction of gold and increased profits. Working costs for treatment had been brought on one plant to below 3s. per ton, and on most modern plants this is not greatly exceeded. Extraction of gold is from 90 to 97 per cent., and in May, 1914, the total tonnage treated was over 2,100,000, and the gold produced was valued at £2,927,798; this employing 9,220 stamps and 285 tube mills. Reference was also made by the lecturer to means for abating the nuisance of dust from sand dumps by spraying with mixtures of mud or slime; to iron works, foundries, etc., which supplied other metallurigcal needs; also to the installation at the South African School of Mines of an ore treatment plant by which treatment methods for all metalliferous ores could be tested or devised. In concluding, the author attributed much of the rapid progress to the free interchange of information by means of the numerous and active technical societies of the Witwatersrand. Professor Stanley was thanked for his able lecture on the motion of Professor Schwarz, seconded by Professor Cery.

MINING MEN AND MATTERS.

The organisers of the International Engineering Congress, to be held in San Francisco in 1915, under the auspices of the five National Engineering Societies of U.S.A., have decided that the papers of the Mining Section are to relate to the economic and social relations of mining. It is interesting to learn that Mr. W. W. Mein, now Consulting Engineer to the International Mines and of the Canadian Mining and Exploration Co., has been selected to cover the subject of "Valuation of Metal Mines and Prospects," which is one of the ten subdivisions into which the proceedings of the Mining Section is to be classified.

The list of certificates issued by the Mines Department for the month ending July 11th, 1914, is as follows:—Mine Surveyors, W. G. N. Titley. Mechanical Engineers' Certificates (Mines), A. M. Baker, H. H. Dahll, D. M. Davidson, C. J. Farquhar, G. E. Farrar, J. Jones, W. Mitchell, C. O. Schmidt, F. J. Strick and A. M. H. Thorp; (Works), S. F. May. Electrical Engineers' Certificates (Mines), H. H. Dahll; (Works), S. F. May. Mine Overseers' Certificates (Metalliferous), A. Barr, R. M. Ferguson, N. W. Graham, J. M. Kellett, A. S. Knight, J. C. Peake, S. Shepherd; (Collieries), W. Gerrard.

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SOME RECENT CONTRIBUTIONS TO SOUTH AFRICAN SCIENCE.

Papers Read before the S.A. Association at the Kimberley Congress.

Amongst the papers read at the Science Congress at Kimberley last week was one by Dr. J. Lunt, F.I.S., F.R.A.S., on "The Spark Spectrum of the N'Kandhla Meteorite and of Other Meteoric Irons." The paper described a spectrographic examination of the N'Kandhla meteorite and of four other meteoric irons—the latter furnished by the Director of the South African Museum, Capetown—undertaken in the hope of detecting the presence of elements which might have escaped recognition in Professor Stanley's chemical analysis. The spectra were photographed with the four-prism star spectrograph attached to the Victoria telescope at the Royal Observatory, Cape of Good Hope. The sparking apparatus consisted of an 18in. coil and large plate condensers. The paper was illustrated by photographs showing portions of the spectre lying between wave lengths 4071 and 4731. In addition to very numerous iron lines, the spectra show lines of nickel, cobalt, chromium, barium, and calcium, the last four of which elements were not detected chemically. The metals magnesium, platinum, and copper recorded as present in traces in the chemical analysis were not detected spectroscopically. The spectra were critically examined for lines of rubidium, gallium, lead, silver and potassium, reported as present in meteoric irons by previous observers, but the lines of these elements were not found in any of the spectra. The paper was further illustrated by a photomicrograph of rhabdite crystals remaining as a residue, insoluble in hydrochloric acid, from the Hex River meteorite. A table of the wave-lengths of the lines other than iron lines in the spectra of the meteorites was given. Mr. E. Jacobs, B.A., contributed a paper on "The Radio-activity of the Atmosphere." He said that, from observations of the activity of a wire charged to a high negative potential and exposed in the open air for several hours, the relative amounts of radium and thorium present in the atmosphere at Capetown had been determined. Of the activity of such a wire about 20 per cent. was found to be due to thorium. It is calculated that there is per unit volume of the atmosphere 28,000 times as much radium emanation as there is thorium emanation. The activity of the matter collected by the wire is least immediately after rain and greatest after heavy S.E. winds. Dr. Versfeld gave an account of some recent mineral discoveries in Namaqualand. The more important ones were tantalite, columbite and bismuth ores. Hopes were entertained that several of these deposits were workable propositions. On the whole, Dr. Versfeld had a favourable opinion of the prospects of Namaqualand from a mineralogical point of view. Dr. Versfeld, B.A., sent in a paper of a rare mineral phosphate from Lobito Bay. This dealt briefly with the occurrence at Lobito Bay of a very rare mineral, lazulite, an hydrated phosphate of aluminium, magnesium and iron. The sample was sent to the writer for analysis of copper, the mineral having a deep blue colour, not unlike some samples of azurite, which is a surface ore of copper. The physical and chemical properties of the mineral are described, and the results of the analysis given as follows: Phosphoric oxide, 46.40 per cent.; magnesium oxide, 7.23 per cent.; ferroux oxide, 7.02 per cent.; aluminium oxide, 34.10 per cent.; water, 5.22 per cent.; total, 99.97 per cent. Traces of silica and lime were also observed. Since the substance is quite unaffected by acids, and can be rendered soluble only by fusion with alkaline carbonates or bisulphates, its use as a fertilizer will obviously depend on the discovery of a suitable method of rendering the phosphoric oxide available for plants. In the meanwhile many collections of minerals should benefit by the inclusion of good specimens of a rare substance. As far as can be judged by the appearance of the sample, the mineral seems to occur in a pegmatite.

"The Boston News Bureau" quotes a copper producer as follows: "Of all the useless statistics which are published, those of the Copper Producers' Association are entitled to the blue ribbon. In the first place, they act as a deterrent on purchasers by the consumer for several days before they are made public. Then if a decrease in surplus is shown the consumer charges that the figures are not on the level. If an increase is shown everybody seems to think that the accumulation would have been greater had not some copper been "stored" abroad, or in some manner held back. The figures are, however, accurate and put out in good faith, but why the producers of copper should be unique in telling how much of their product they have on hand for sale is beyond comprehension. The discontinuance of the monthly statement has often been discussed among the members of the association, and the sooner some action is taken along this line the better it will be for all concerned. Then would probably come the charge that the producers were afraid to publish facts." How often we have all heard much the same said about the Rand monthly output figures!

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Finance, Commerce, and Industries.

Farming in South Africa.

An interesting interview with Mr. C. du P. Chiappini appears in the Empire Day Supplement of the *Financier*. "I know of no country," says the popular Trades Commissioner, "where there is a better opening for the sons of gentlemen who wish to engage in farming pursuits than South Africa, but South Africa, from an agricultural viewpoint, is, fortunately or unfortunately, a country which requires men of some education and with moderate capital. I consider that the possibilities of success in farming and the prospects of big profits are considerable, but the problems of farming are numerous. I would recommend young men to go out to South Africa as soon as they have left school or college. They need not know much about agriculture, as conditions there are so different. What would be useful would be a knowledge of the manufacture and working of agricultural machinery, and if the young men knew something about surveying and engineering, so much the better. A white man on a farm in South Africa is expected to be able to mend a part of a machine when it breaks, or to drive an engine, or put up a pump, or make a dam, or survey a water furrow. These are things young men should acquire some knowledge of before they go to South Africa. Certainly it would be well for them to know something about butter-making, cheese-making, etc., but they can be taught all that here."

* * * *

Chinavane Railway Finished.

The line of the Chinavane Railway, which will connect the Incomati Sugar Estates with the main Delagoa Bay line, was finished last week. The work, which has been carried out under the superintendence of Mr. R. [illegible], an engineer who has had a great deal of experience in the building of Low Veld lines, may well be described as one of the smartest bits of railway construction in South Africa. The line extends to 89 kilometres (55 miles), of which 45 kilometres, or 28 miles, with culverts, bridges and all, were completed in two months.

* * * *

Five Months' Trade.

The trade returns for the first five months of the current year throw a good deal of light on the slump in the oversea trade of the Union which commenced at the end of last year. For the five months, January to May, the imports of the Union were approximately 13 per cent. below those of the corresponding period of last year. In May, notwithstanding a very heavy fall in the exportation of diamonds, which is probably due to causes other than the general condition of trade, they were only 7.15 per cent. below those of May, 1913. The decrease in exports of diamonds during the month, as compared with the same month last year, amounted to £650,000 (£353,672, as against £1,005,567); the decrease in the total exports of merchandise during the month amounted to less than £400,000. Taking the figures for the five months, it will be found that the decrease in imports is pretty general all round, and is shown in commodities affecting all sections of the population. There are some noteworthy exceptions. The agricultural interests of the country do not appear to have felt the effect of the slump severely. There is a continued increase in the importation of agricultural implements and machinery, fencing wire, tanks, iron pipes, and manures and fertilisers, windmills, and bags for grain and wool. Very few of the categories of imported goods chiefly required for the prosecution of agriculture show a decrease. For some unexplained reason there is a heavy drop in the importation of sheep-dip, while the materials from which dips are chiefly made in this country also show a falling off. This group of items, however, stands by itself, and the figures relating to it are probably susceptible of some explanation which does not interfere with the general inference that agriculture is prospering and progressing. Increases in the importation of mining machinery indicate an optimistic view of the immediate future of the mining industry. On the export side of the table there is, fortunately, evidence of better omen. The total exports of South African produce in the five months, January to May, this year were £24,881,482, as against £28,581,959 in the corresponding period of last year, showing a decrease of £3,697,177. This amount is made up as follows: Decrease in gold, £2,122,583; on diamonds, £1,540,444; on other merchandise, £31,450. The circumstances which have led to a reduction of the quantity of gold available for export are only too well known, and the exportation of diamonds is governed by other conditions than the balance of trade. It is fair, therefore, to reckon without these staple exports in attempting to estimate the general condition of the trade of the country. If gold and diamonds are ignored, the exports of the Union for the five months are only £31,450 short of the total of the corresponding period of last year, when all previous records were put into the shade. With three notable exceptions, all the staple exports of the Union show continued advance. Exports of wool were £89,000 above last year in value, though the actual quantity, measured by weight, was slightly less. Angora hair shows an advance of £66,000, which is proportionately greater. The exports of fresh fruit were more than double last year's (£70,000 against £33,000), dried and preserved fish showed an advance of £11,000, and bark of £30,000; maize, owing to the improved crops, jumped from £8,000 to £126,000. The production of copper-ore rose from £158,000 to £319,000, and of tin-ore from £152,000 to £222,000. Whale-oil and by-products, spirits, meats, argol, and asbestos are

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other items showing substantial progress. In the aggregate the increase on these goods almost counterbalanced the effect of the slump in ostrich feathers, exports of which fell from £1,334,000 to £917,000, combined with reductions, less easy to understand, in the exports of coal (£66,000) and hides and skins (£130,000). On the whole, therefore, the general trade outlook is by no means unpromising.

* * * *

Helping Swaziland Trade.

In accordance with notice given some weeks ago, the C.F.L.M. commenced last week to run goods by motor trolley to and from Goba station and the Swaziland frontier. The innovation, as may be conjectured, will greatly encourage Portuguese commercial relations with the Protectorate. The charge per ton for carrying goods from or to the border is 2,500 reis (about 10s.) per ton.

* * * *

De Beers' Activities.

At a banquet in the Kimberley Club, last week, Dr. Darley Hartley proposed the toast of De Beers. He paid an eloquent tribute to De Beers hospitality. He likened Johannesburg and Kimberley to the two hearts of South Africa. The former gave trouble at times, but Kimberley was sound. He referred to those who assiduously preached the doctrine that De Beers was a menace to the country, and said he wondered what would happen if these people got their wish and De Beers was crushed. Mr. Francis Oats, chairman of De Beers, replying, disclaimed credit for De Beers Company for what had been described as lavish hospitality. After all, the directors of De Beers were only carrying out the sacred trust of Rhodes, and although it was no light task, still, in assuming responsibility for that trust, they were only doing their duty. Mr. Oats referred to the fact that De Beers had built the Alexandersfontein Hotel, and laid out the gardens and trams thereto, at a cost of £100,000, with an annual charge of £3,000, and no return. They had also established an electric tramway between Kimberley and Kenilworth with no hope of financial return. Snarlish shareholders might regard these matters in the light of unproductive works, but if the company did not seek the comfort and happiness of its workers a snarlish community might result, which would cost the shareholders more. De Beers sought the welfare not only of Kimberley, but of South Africa as a whole. He referred to the fact that the company built the Fourteen Streams-Klerksdorp railway at a time when there was no prospect of return, and, with four years of the concession unexpired, handed it over to the Government, who wanted the line. De Beers ran it at cost, but the Government made an annual profit of £50,000 on this section. He thought it was well they should know these things in view of unfair criticism. Another good work done by De Beers was the introduction of the closed compound system. He did not want to throw stones, but he believed that until Johannesburg introduced a similar reform they would never become the same orderly, settled community that Kimberley was. Mr. Oats concluded with a protest against the principle of provincialism and an appeal for nationalism.

* * * *

Two tenders were sent in for the construction of a pier at Inhambane, in T shape, and utilising the present pier in the plan, viz., that of Mr. P. B. Buccellato, for £21,800, and Mr. A. Muia for an additional £20,000. The contract, it is needless to say, has been awarded to Mr. Buccellato.

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The Eight Hours' Day.

In the House of Assembly last week Mr. Merriman, in the course of some remarks on the estimates of the Department of Mines, referred to the experience of the coal mines in Great Britain in connection with a compulsory eight hours' day. The right hon. gentleman mentioned a report which stated that " accidents in England were largely due to the eight hours' day ": whereupon the member for Springs said he hoped Mr. Merriman " did not seriously advance the argument that it was on account of the eight hours' day that the accidents occurred." The facts are given by a Labour contributor to the London *Times* in an article published in that journal on June 2nd. The Eight Hours Act, which was forced on the industry by the Miners' Federation, is denounced by this writer as "a proved curse." It has, he tells us, " increased the hazards, reduced the earnings, and spoiled the leisure and social life of the miners." In the ten years before the Act came into force, the deaths from mining accidents are stated to have averaged four per working day. In the first two years under the Act they averaged six per day. In 1910 over 1,800 miners were killed outright, against an average of less than 1,200 for many years previously. " To make the industry fit the law, working shifts had to be altered, dangerous methods and appliances had to be adapted, haulage and windage had to be speeded up, and repair work was scamped." In other ways according to this writer, the Act has not been to the advantage of the miners. Workmen's compensation cases dealt with in the Glamorgan County Courts show that miners' average earnings are seven shillings a week less under the Eight Hours Act than before. The restriction of hours, moreover, has caused the introduction of inconvenient shifts. In some cases men had to work an extra shift per week, and in others lose their Saturday and Monday short shifts because they could not work long shifts on mid-week days. In some cases social and domestic customs were completely upset, and evening leisure seriously interfered with."

* * * *

The idea put forward by the Conference of Diamond Producers with reference to a central selling agency is heartily welcomed by the big European houses. It is understood that the regulation of the output will be enforced immediately, and the working of the details of the agency will be completed next year.

"Mines of Africa."*

We have to acknowledge receipt of Mr. R. R. Mobson's excellent work, " M.O.A.," for 1914-5. In the preface attention is called to two important matters in respect of the future of Rand mining companies—(1) the lives of the producing companies, and (2) the outlook of ability to reduce costs. As to the latter point, the influence on profit of 1s. per ton decline in costs is remarkable. The total profit of the Rand mines in 1913 was some £12,000,000, derived from 25,682,432 tons treated. Had the work been performed at 1s. per ton reduction of costs and the grade remained unchanged, the profits would have been increased by £1,400,000 " M.O.A.," as the volume is designated, is a presentation of a multitude of official facts respecting the leading South African, Rhodesian, West African, and Nigerian mining, etc., companies. In brief form the history of each enterprise is given, with detail of property, capitalisation, personnel, etc. The work is designed to serve the careful man who desires to know the record of each company as to the results of the past and the outlook of the future. Information as to extent of property is accompanied by description of the ore deposits, the development showings of the different reefs, the amount of ore that has been brought into sight, and calculations as to the probable duration of each of the principal Rand mines: e.g., an estimate as to the " life " of a mine using, say, 600,000 tons a year being 22 years. In this respect " M.O.A." has a practical bearing for those who look ahead and desire facts and figures relating to the experiences of the past, so as to be able to form opinions as to the possibilities of the future. In the tabular appendix to the preface appear tables which enable the investor in mines to ascertain the value a share should stand at to give him a yield varying from 5 to 10 per cent. income, and provide for redemption of capital by the end of a " life " of the mine from one to fifty years; e.g., the present value of a £1 share of an assumed mine with a life of 22 years is 10.08 years multiplied by the average dividend expected per year, to give the investor 7 per cent. a year income, and redeem his purchase price by the end of 22 years through investmnet of the surplus dividend at 4 per cent. In all respects " M.O.A." is a work of reference of practical character.

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* About 678 pages, with Maps. Large crown 8vo., 21s.; by post, 21s. 4d.; Colonies and Abroad, 21s. 8d. Special Edition, interleaved for professional use, 30s.; by post, 30s. 6d.; Colonies and Abroad, 31s. 3d.

The Origin of the Diamond.

Before the South African Association for the Advancement of Science, Dr. W. Johnson, L.R.C.P., L.C.C.S., read a thoughtful paper on the origin and formation of the diamond, a subject that has often been discussed in the past, but one possessed of so much scientific interest that further contemplation of the problem is always worth recording. Dr. Johnson, in the course of his address, remarked:—

"My view of the matter is that graphite probably took no part in the formation of the diamonds at all, but that they were formed from another carbonaceous material before it had reached the stage of graphite. The factors determining whether a certain carbonaceous material should undergo a change to graphite or to diamond were a high pressure and a certain temperature, probably not very high, not higher, perhaps, than a low red heat. This view quite accords with the opinion expressed by Sir William Crookes years ago when he declared that the difference between graphite and diamond was probably a difference of pressure at the time of formation: that is to say, that other conditions being favourable certain carbonaceous substances undergoing metamorphosis might, if the pressure were sufficiently high, be transformed into diamond, whereas at a lower pressure they would be changed only into graphite. Such a view dispenses with a high temperature, and all the difficulties that attend the theory of the high-temperature formation of the diamond. It also accords with the fact that when the graphite that is found in the blue ground is examined it is seen to have the character of natural graphite. It still contains a small proportion of oxide of iron and silica like natural graphite, and reacts with strong sulphuric acid just as natural graphite does . . . Regarding the different character of the diamonds, not only in different pipes and dykes, but also in different parts of one and the same pipe, the geologists up to and including Dr. Wagner very fully, and very properly, have called special attention to it, and yet it does not seem to occur to them that it would be a very difficult matter to reconcile the fact that there are in some pipes, for instance, four or five different columns of Kimberlite, each with different diamonds, with the supposition that all those columns came from a presumably white hot common centre of molten rock. Such differences are surely more likely to arise under conditions of igneous metamorphism than if all this vast rock magma in a white hot molten condition, and extending over hundreds of miles, were the proximate source of the materials filling the pipes."

C.B.M. Closing Down.

We regret to learn that the C.B.M. Company's mine at [illegible] has been closed down temporarily, says the local paper. Very large sums have been spent by the partners on the development and equipment of this property. Everything has been done thoroughly, and it is a great pity that it should have to close down, even temporarily. The plant is one of the best in the district, and neither money nor pains have been spared to bring it to the producing stage. It is closed down temporarily, pending further development, and we sincerely trust that it will be possible to start operations there again within a few months.

Oil indications have been discovered again on the Harrismith Town Commonage. A farmer drilling for water put down a borehole for 400 feet, and drew up a greasy substance with a strong smell of petroleum. The Town Council visited the spot yesterday and took samples, which are to be submitted to Bloemfontein for analysis. Meantime, the borehole has been sealed to prevent any tampering.

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Electric Light for Farms.

An interesting letter from a South African engineering firm specialising in small electric installations for farms is referred to in the current *Agricultural Journal*. The correspondents state that they have laid down a number of such plants in their district which have been running continuously and giving every satisfaction. A recent instance of their work was the installation of a fine plant of forty odd lights for a well-known farmer in the Cape Province. A notable point in this system is the automatic working of the plant. The engine is started automatically from the house by switching on four or five lights. After the engine is started it runs continuously, charging the accumulators until sufficient current has been stored in them, when it automatically cuts out, ceases charging the accumulators, and supplies the lights direct, leaving the accumulators fully charged as reserve current. To stop the engine in the engine-house, all that is necessary is to switch off a few lights in the homestead and then switch on to the accumulators. It is sufficient to run the engine once a week in order to charge the accumulators, as they contain sufficient current for about fifteen lights for that period or even longer. An interesting point in this plant is the fact that, when one starts the engine, should the accumulators not be sufficiently charged, they charge themselves automatically and stop when they contain sufficient current. The plant is costing the farmer in question about fifteen shillings a month, so we understand. The outlay is £250 in all, which includes automatic starter, a set of twenty-seven block accumulators, installed with twenty-five lights of 25 or 32 c.p., and complete with engine, switchboard, dynamo, instruments, generator, necessary fittings of all description, switches, etc. It is conveniences such as this which make for greater comfort and add to the attractiveness of farm life.

Lydenburg (Transvaal) Gold Exploration Co. at the end of 1913 had a credit balance of £42, as compared with £123 for 1912. The cash balance shows a reduction of £809 12s. 5d., which is mainly accounted for by increase in stock at the trading stores and expenditure on plant and tree planting. Prospecting was carried on continuously, but as results were disappointing it was suspended at the close of the year. The development of the agricultural and stock raising possibilities of the company's property continues to receive the attention of the board.

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DECLARATION OF DIVIDEND No. 26.

NOTICE IS HEREBY GIVEN that an Interim Dividend of 10% (2/- per share) has been declared by the Board for the half-year ending 31st July, 1914, payable to all Shareholders registered in the books of the Company at the close of business on the 31st July, 1914.

The Transfer Books will be closed from 1st to 7th August, 1914, both days inclusive.

The dividend will be payable to South African Shareholders from the Head Office, Johannesburg, and to European Shareholders from the London Office, No. 1, London Wall Buildings, London, E.C., on or about the 4th of September, 1914.

By Order of the Board,

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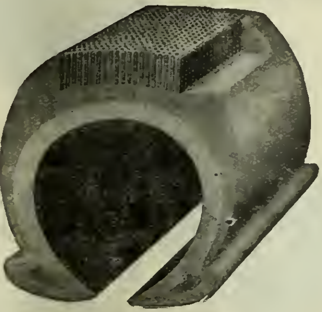

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AUTOMOBILE NOTES.

Speed of Motor Cars.

Owing to the increasing number of motor car accidents in Capetown, many of them unfortunately attended with fatal results, the Capetown City Council has been compelled to take action with reference to the speed of petrol-driven vehicles, especially when rounding corners. At the last meeting of the Council, the responsible committee reported that it regarded the junction of all thoroughfares with Adderley Street as dangerous corners, likewise the junction of all thoroughfares with Long Street. It recommended that, if it was possible to secure the consent of the Administrator, the speed of motor cars be limited to six miles an hour at these points. As regards the speed of motor cars upon main roads, the committee was of opinion that on the main road from the municipal boundary at Camp's Bay to the municipal boundary at Claremont, representations should be made to the Administrator to allow the speed limit to be reduced to 20 miles per hour, and for the purpose of any order which may be made in connection with such Main Road, Somerset Road, Waterkant Street, Adderley and Darling Street and Sir Lowry Road, be considered as main roads. The committee further recommended that the section of the Newlands Road, from the boundary of the municipality at Claremont, and Paradise Road, in extension of such thoroughfare as far as Riverside Road, be similarly treated. The committee felt, however, that with regard to that section of main road situate within the Kalk Bay Ward, from a point above the Fisheries, extending throughout the limits of the ward to a point at the junction of Albertijn Road, Muizenberg, required to be specially dealt with, and the speed of motor cars further restricted, and it recommended that the Administrator be approached with a view to an effort being made to induce the Administrator to allow the speed of motor cars in this section of the thoroughfare to be reduced to 15 miles per hour, the special reason which might be urged in this connection being that the committee considered that in consequence of the narrow width of carriageway, which was largely used for promenade purposes by pedestrians, a speed exceeding 15 miles per hour would be dangerous to persons other than motorists using the thoroughfare. Similarly, the committee considered that an order should be made restricting the speed of motor cars to 15 miles an hour at the bends on that section of the Victoria Road situate between a point above Bantry Bay and the junction of the old Kloof Road, above Bachelor's Cove. It might be stated that all municipal regulations controlling motor traffic were repealed under the provisions of Motor Ordinance No. 9 of 1914, section 10 of which provided that "no persons shall drive a motor car on a public road at a speed exceeding 30 miles an hour within a radius of three miles of any municipal area" and "at dangerous corners, cross roads and precipitous places, or within limits specially defined in each case by the local authority having jurisdiction over roads in that area or by the Administrator if there be no such local authority, no person shall drive a motor car upon a public road at a speed exceeding the rate which may be prescribed by the local authority and approved by the Administrator, which shall not, except for special reasons, be less than 20 miles an hour."

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

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Property Markets.

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CONTENTS.

PAGE
Notes and News 553
Topics of the Week:
  The Problem of Mine Labour 555
  An Industrial Betterment Committee for the Rand 556
The Modderfontein Mines and the Van Ryn Deep ... 557
Latest Returns from S.W. Diamond Fields 558
The South African Tin Industry 559
Indimba (Swaziland) Tins: Two Monitors at Work ... 559
The Petroleum Deposits of South Africa and Their Value to the Empire—II. 560
The Manager and Staff of the City Deep Circular Shaft 561
The Economic Use of Workmen on the Rand—I. ... 562
Industrial Betterment Activities in the U.S.A. 563
General Gorgas Anticipated: The Native Compound at Leeuwpoort Tin Mine 563
Steel Trust Pays £1,100,000 a Year for Welfare Work 564
Correspondence and Discussion: "Mine Claim Areas"; "Insurance Questions at Issue"; "Economics of Citrus Growing" 566
Rhodesian Section:
  Latest Mining News 567
Engineering Notes and News 569
Finance, Commerce and Industries 570
Company Meetings: New Kleinfontein Co. 571
The Week in the Sharemarket 572
Special Banking Supplement ... ... i.

Notes and News.

The Tweefontein Colliery's Purchase.

The Tweefontein Colliery Company is extending its operations. The company has just acquired the Premier Coal Company's property, situated at Wakefield and to the west of Witbank. The Premier coal mine has been idle for some considerable time, but the output allotted to it by the Transvaal Coal Owners' Association was 120,000 tons per annum, and it is understood that this allotment has been transferred to the new owners. As to the new chemical works of the company, it is reported that an active step will be taken in this direction during the next few months. It is proposed to erect the works alongside those at the Tweefontein Colliery for the purpose of extracting sulphate of ammonia from waste coal.

* * * *

The Union's Collieries in June.

The coal output of the Union for last month was substantially below the May total, the tons sold being 773,457 in May and 728,101 in June, and the value realised £204,265 in May and £192,599 in June. Both the Transvaal and Natal—the two leading coal producing Provinces—record declines in production. In the Transvaal 28 collieries were producing and the quantity of coal sold was 432,440 tons, value £96,602, or 4s. 5·61d. per ton, as compared with 457,091 tons, value £101,516, or 4s. 5·3d. per ton in May. In Natal there were 20 productive coal pits. There were sold during June 227,188 tons for £75,691, as against 250,646 tons for £83,209 in May. Of the Transvaal's return 334,260 tons, of a value of £74,744, were produced in the Middelburg area.

* * * *

Bechuanaland Exploration.

In June, 1908, the Bechuanaland Exploration Company reduced its capital from £400,000 to £200,000 by writing of 10s. per former £1 share, this policy enabling the company to re-enter the dividend stage. A circular has been issued this week announcing a projected increase of capital to £350,000 for the purpose of acquiring the assets of the Northern Copper (B.S.A.) Company, Ltd., on the terms that for each 10 Northern Copper shares of £1 each there will be issued nine 10s. shares of the Bechuanaland Exploration Company. In respect of the operations for the year to March 31, 1914, the Bechuanaland Exploration Company distributes a dividend of 4 per cent., absorbing £8,000, the same as for each of the two previous years.

* * * *

Natal Bank's Absorption.

The terms upon which it is proposed to merge the Natal Bank into the National Bank of South Africa were disclosed this week. The transaction is of a very simple description. The shareholders of the Natal Bank are to receive National Bank scrip equivalent to their paid-up capital in Natal Bank shares. The capital of the Natal Bank consists of 25,884 shares of £10 each, designated as "A" shares, and of 148,232 "B" shares, also of £10 each. In the "A" category £5 per share has been paid up, and in the "B" category £2 10s. per share. This makes a total paid-up capital of £500,000. The shares of the National Bank are £10 fully paid up. It is proposed to give 50,000 National shares for the Natal Bank holdings. At the date when the provisional agreement was effected, National Bank shares were quoted in the London market at from £11 15s. (buyers) to £12 5s. (sellers). The two classes of Natal Bank shares were quoted at fractional premiums. Those shareholders of the Natal Bank who do not wish to convert into National Bank shareholders will have the option of obtaining £11 10s. in money per share, in lieu of scrip. Assuming that a shareholder agrees to the exchange of scrip, he will receive one National Bank share for two "A" shares or four "B" shares of the Natal Bank. The deal, it is plain, is excellent business on both sides.

To Encourage Prospecting.

At Gatooma, the other day, the Small Mine Workers' Association, after a lengthy discussion, unanimously decided that the main causes for the cessation of prospecting were as follows:—(1) Lack of capital; (2) the steadily increasing cost of boys and other expenses; (3) the fact that all "old workings" had been located and it was now necessary to seek virgin reefs, which greatly increased the costs of the prospector; (4) the lack of crushing facilities and other assistance to prospectors. It was further resolved that the Government should be notified that, in the opinion of the Association, (1) the Government should adopt a system used with great success in Western Australia; any payable ore discovered by a prospector should be valued and purchased by them from the dump; (2) in approved districts, where there were several small properties within a radius of five miles, a Customs mill should be supplied, where the ore mentioned in the above clause should be crushed; (3) the B.S.A. Company should be requested to supply prospecting outfits to *bona fide* prospectors—these to include labour, pack donkeys, and the necessary tools, etc. Government officials in each district should also be instructed to enable them to obtain provisions, medical assistance, etc.

* * * *

The New Refractory Ores Process and the Woodbush Mine.

In recent issues we have referred to the new refractory ores process and the promise this method holds out for properties containing ore not amenable to simple methods of treatment, such as ore found, for example, in the Barberton district. In addition to auriferous rock from the Eastern Transvaal, the method has been experimented with in regard to the Pietersburg district. The Woodbush Mine, near Haenertsburg, is one of those properties which on account of its refractory ore has been the despair of a number of syndicates, which have worked the mine from time to time for many years, but have had to abandon operations owing to the gold-bearing reefs becoming refractory with copper. The new electro-chemical process has been tried on the refractory ores of this property on a small scale with excellent results, for the extraction is said to have been copper (total) and gold 95 per cent. after cyanidation. There is a ten-stamp mill on the property and a large quantity of water power is available. All that remains for the "refractory" operations to be commenced is the building of a new plant for the electro-chemical process and the installation of electric plant. Development is proceeding under the aegis of the Haenertsburg Gold and Copper Co., Ltd. The ore is said to range from 7 dwts. to 10 dwts. of gold and 2 to 7 per cent. of copper. The operations will be regarded as affording a thorough test of the new process which, as stated, has already given satisfactory results with the samples taken from the mine. Further tests, carried out on a larger scale during the past week, are said to have given excellent results.

* * * *

"Lost Land of Agulhas."

At the Science Congress at Kimberley, last week, Professor Schwarz aroused considerable interest by a paper on "The Lost Land of Agulhas." He remarked that in the older rocks of South Africa there were certain formations which allowed one to reconstruct the geography of the country in past times, such, for instance, as the Malmesbury beds in the South-west of Cape Province and the dolomite series of the Transvaal and Bechuanaland. The evidence, so far as one could disentangle it, pointed to the fact that in those times the whole of South Africa was submerged under deep sea, abysmal in the north, and shallower, but still deep, in the south. The dolomite originally was similar to the chalk of England. In the south, mud and sand were carried into this ocean from a land area to the south of our present country, mingled with the calcareous ooze in Van Rhyn's Dorp and at the Cango in Oudtshoorn, forming layers of limestone in the shales. Finally, in the South-west the sandstones and clay slates, such as one saw in the Lion's Rump at Capetown, were formed within a hundred miles of the shore, made up entirely of sediments derived from the denudation of a southern continent, the lost land of Agulhas in the time during which was laid down the Table Mountain the sandstone that formed Table Mountain and coastal ranges of Cape Province. This southern continent came into prominence and continued through the succeeding periods till in the Karoo period it extended far to the North. The Karoo beds were laid down in a lake in this expansion of the lost land of Agulhas. In recent times this lost land had been submerged, but soundings in the Indian Ocean showed that there were a number of submerged plateaus showing evidence for believing that they were once dry land. From such plateaus rose, for instance, the Kerguelen and Crozet Islands and Mauritius. The symmetry of the continents about the South Pole demanded a land area to the east of South Africa and the submerged plateaus would occupy the place where such a continent should be.

* * * *

Suggested Remedy for Industrial Unrest.

Under the title "Industrial Unrest: A Practical Solution," and with an introduction by Mr. F. E. Smith, there has been published the report and recommendations of the Unionist Reform Committee which for nearly two years has been considering the question of the prevention and settlement of strikes and industrial disputes in general. The authors state that, in view of "doleful prophecies of what may happen in the world of industry in the ensuing autumn, the committee has at least prepared a scheme in anticipation of such a threatened catastrophe as a general strike." The report deals at the outset with the Syndicalist movement, the committee arguing that a general strike must fail because the poorest members of the community will naturally be starved out first. The committee explain that their object is to find some practical means of promoting industrial peace while at the same time promoting national well-being. The committee then proceed to consider whether more use might not advantageously be made of a form of arbitration procedure which, without being compulsory, shall yet be of wider application and carry with it more authority than the limited practice of voluntary arbitration at present in operation. There has been in many trades an encouraging development of a spirit of conciliation, and the assistance of the Board of Trade is now frequently invoked, with satisfactory results. But it is notorious that the machinery of the present Act has proved altogether inapplicable in most of the more widespread of recent labour troubles. The committee then devote three pages of their report to describing the scope and practical results of the Industrial Disputes Investigation Act of Canada, 1907, better known as the Lemieux Act, which, they remark, has met with so large a measure of success that the example is worthy of careful attention.

"With the omission of the penal clauses," the report proceeds, "we are of opinion that legislation is now desirable in this country on the general lines of the Canadian Act. We see no sufficient reason why the English Act should be restricted to 'public utility services.' We would make the Act include all disputes of any considerable magnitude. And we would guard against one real defect in the Canadian Act, and make each board the authority (within a reasonable period) for the interpretation of its own recommendations should any dispute arise as to the meaning of the terms. Therefore, the scheme suggested for this country would be somewhat as follows: In the first place, a Labour Department of the Board of Trade would be constituted. At the present moment the functions of the Board of Trade in industrial matters are divided into three sections, all independent of one another. (1) The work of the Industrial Commissioner in settling disputes. (2) Unemployment Insurance and Labour Exchanges. (3) Statistical. In future all these departments ought to be co-ordinated and placed in a single Labour Department of the Board of Trade under the Industrial Commissioner, who in turn will be responsible to the President of the Board of Trade. In the event of a strike occurring which, in the judgment of the Chief Industrial Commissioner, is of sufficient importance he will be given statutory authority by Parliament to interfere and to appoint, without reference to the President of the Board of Trade, a Board of Conciliation and Investigation. This board shall consist of three members, one appointed on the recommendation of the employers, one on that of the employed, and a third chosen as chairman by the other two, or, if the two parties fail to agree, by the Chief Industrial Commissioner, who shall, of course, in this event have power to act in this special capacity as chairman. This Board would have power to summon witnesses, and it would be its duty to endeavour to bring about an agreement by conciliation, and if this failed, to make a public recommendation for the settlemnet of the dispute. Special pains should be taken by extensive publication in the Press and otherwise to give the recommendation the widest publicity. The recommendation would not be enforced on either party, but its acceptance would be left to depend

> entirely upon the good sense of the parties concerned, and upon the pressure of public opinion. The Board, in the case of a dispute arising as to the meaning of its award, would be the authority to interpret it. This special machinery must be fitted into the case where there is already existing a Voluntary Wages Board."

* * * *

Miners' Phthisis in Australia.

It will be remembered that Statement No. 13 of the evidence submitted by the Chamber of Mines to the Economic Commission deals briefly with the investigations made in Australia and elsewhere in reference to miners' phthisis. To understand the position in Australia it is necessary to bear in mind (1) Australian metalliferous mines are scattered over an extensive area. (2) They are often very small propositions owned by the workers themselves. Of the miners working in Western Australia during the quarter ended June 30th, 1911, only 54·56 per cent. were working for registered companies and were in receipt of a definite remuneration for their services (see page 102 of the Report of the Western Australia Royal Commission on Miners' Lung Diseases, November, 1911). (3) Few records are kept by the companies and none of the investigators have been able to get satisfactory returns of the number of deaths from miners' phthisis or tuberculosis among miners in any given mining centres. (4) As far as the evidence goes it would appear that there is as much miners' phthisis in Australian metalliferous mines as on the Rand, but generally tuberculosis appears to be less prevalent there than it is here, excepting possibly in the case of Bendigo, Victoria. Dr. Cumpston, Royal Commissioner, reporting in October, 1910, on pulmonary diseases amongst miners in Western Australia states:—" It is clear that fibrosis of the lungs is present in all its stages amongst miners in Western Australia, and also that the number of cases of early fibrosis is so great as to call for serious consideration. This existence of a high percentage of fibrosis amongst working miners cannot be attributed to the importation of such cases from places outside Western Australia. This aspect has been dealt with, and it is quite clear that the mines of Western Australia can and do produce fibrosis to an important extent; for amongst machine miners fibrosis is present in 25 per cent. of the men and amongst the dry treatment men in 19 per cent.—these percentages are calculated for those men only who have never worked on mines elsewhere than in Western Australia. . . . Tuberculosis of the lungs is not yet present amongst miners in Western Australia to any alarming extent." In another part of his report Dr. Cumpston states that the examination of 1,805 men revealed the fact that early fibrosis was present amongst machine miners to the extent of 33·16 per cent.; amongst non-machine miners to 7·23 per cent.; amongst truckers to 3·1 per cent.; and amongst dry treatment hands to 24·5 per cent. Intermediate fibrosis was found amongst machine miners and non-machine miners; late fibrosis was found only amongst machine miners. And of the men examined 1·5 per cent. had tuberculosis of the lungs. The folowing extracts indicate the spirit in which the subject of miners' phthisis is dealt with in Western Australia:—

> It is too much the fashion to assume that gold mines can stand anything in the way of exaction. This is far from being the case. The industry is in reality a very speculative and precarious one, and from time to time the investing public gets tired of it. The margin between profit and loss is often extremely narrow, and any undue disturbance would in such cases lead to liquidation for the owners and loss of employment for the working miners, and, which is even more serious, prospectors with new mines to develop would look in vain for the assistance of capital. Many mines have existed for years and achieved nothing beyond the regular payment of wages; not only have they received no interest on the expenditure of capital, but the capital itself has been swallowed up. The only attraction of mining for the speculative capitalist lies in the occasional prizes, which, after all, bear only a small proportion to the blanks. A return furnished by the Chamber of Mines shows that in the twelve months ended the 31st August, 1911, only 13 companies paid dividends, several of the more important mines having dropped out of the divdend list since the previous year. It is true that some of these hope to resume the payment of dividends after a period during which they look forward to nothing but expenditure in development, but others in the meantime may drop out of the list owing to the increase in working costs and lowering of the grades of ore. A lighthearted and indiscriminate ordering of expensive machinery for ventilation or any other purpose might cripple all but the richest of mines and would be the death-knell of a great many that have not yet reached—if they ever will reach—the productive stage.

TOPICS OF THE WEEK.

THE PROBLEM OF MINE LABOUR.

WHEN nearly a year ago this paper called public attention to the anomalies that surrounded the question of the "Colour Bar" on the mines of the Rand, there were not wanting critics, even within the industry itself, to describe the raising of the matter as academic and ill-timed. For our part, we have held all along that it was neither, and we honestly believe that the discussion of the question, by revealing to the white workers of the Rand a contingency of which they had not thought, did more than anything else to bring them to their senses. Since then the whole matter has come in for attention from several quarters. The Union Parliament, at the instance of Mr. J. X. Merriman, has devoted a day to its debate; two Commissions—the Economic and the Dominions Royal—have, in their reports, plumped for reform in regard to it; the English reviews and dry-as-dust monthlies have published long, philosophic articles on the inequity of the existing conditions; and Rand chairmen have made several passing, but significant, references to it in the course of their annual speeches. More noteworthy still, no recent gathering or congress in the native territories but has seen the subject keenly discussed, and Mr. Buckle's recent report showed that the natives everywhere were fully alive to the artificial disabilities under which they laboured on the Rand, and genuinely anxious to have them removed. No paper, however, has dealt with the matter in greater detail than ourselves, and the articles printed in these columns have shown the gradual tightening of the legal shackles on the economic freedom of the coloured labourer; the injustice of restricting those shackles to the mining industry of the Transvaal, and the impossibility of successfully working mines in Rhodesia and other portions of the Union were similar restrictions operative in respect of them. All these generalizations and broad conclusions were, we admit, vitiated by the absence of exact estimates of the significance of change to the industry. To Mr. E. J. Way we are now indebted for meeting that need. In an address of great clarity and real statistical value, read before the South African Institution of Engineers last Saturday night, Mr. Way, the new President of the Institution, presented an extraordinarily important collection of data reflecting in detailed figures the economics of the removal of the "Colour Bar." Mr. Way illustrates the generalizations and conclusions that the subject has already drawn forth by actual estimates, framed conservatively by experienced engineers and mine managers. The importance of his contribution to the discussion of the question cannot therefore be overestimated. Critics galore have already appeared on the scene, but all with wonderful unanimity have taken refuge in violence of rhetoric and sweeping, not to say minatory, condemnation. Mr. Way, of course, can afford to ignore criticism so very far wide of the mark. He can truly say that he did not discover the "Colour Bar." In fact, his paper may be described as a clear-headed, practical—above all, practical—contribution to a question that was in danger of becoming water-logged with the well-rounded euphemisms of platitudinous Commission report writers. The daily papers—except, perhaps, *The Star*—have done less than justice to Mr. Way by their published collection of snippets from his address. No wonder the much misrepresented author is bombarded by anonymous correspondents jealous of defending the white race from imputations that were not conveyed and were never meant to be conveyed, in the complete thesis. The subject is far too delicate to take any liberties with its treatment or to play sub-editorial tricks with the context; and we at least mean to do Mr. Way the simple justice of printing an almost *verbatim* report. At the outset of his address he has done us the honour of repeating our quotations from the thought-compelling paper of Dr. Caldecott's on the colour question that appeared, it seemed to us, at so opportune a moment. Nothing quite so striking and courageous in regard to the subject has, to our knowledge, ever appeared in print; and it is refreshing to find that instead of falling on stony ground, like so much that ought to—but does not—compel attention in our midst, the views of Dr. Caldecott have served to strengthen the convictions of so practical a thinker as Mr. Way. It would be a work of supererogation to attempt here to paraphrase, condense, or point the moral of Mr. Way's remarks. Among our leading engineers he has always enjoyed a reputation for clearness and power of expression such as is given to few. Certainly his paper justifies that reputation. If any one point stands out more than another in his argument, it is the need for the public recognition of the fact that reform of the present basis of labour in the industry is essential to the realisation of its fullest possibilities. Put in another way, economic freedom in the industry and equal opportunity in the labour field are alike essential to the working of all our natural resources to the greatest benefit of all concerned. The present artificial basis, it may be said, means for the industry a comparatively short life and a sad one, while reform and the removal of man-made restrictions mean prolonging it indefinitely. Goodness knows, this is a sufficiently popular and acceptable view to prevent Mr. Way being incontinently condemned by every scatter-brain who now rushes to heave a brick at him—yet they cannot see it! Mr. Way will live to be understood, and the cause he advocates will, of course, ultimately triumph and "make good." Meanwhile he must be content, like ourselves, to watch the slow educational movement go on as a process of peaceful penetration, making converts every day. Patience is necessary and tolerance and good humour. At the risk of dropping into the frugal and calculated prolixity of the framers of Commission reports, we would add that the mining industry is too basic an industry in the national organism to be permitted to continue on other than a permanent, natural foundation in respect of its labour factor.

AN INDUSTRIAL BETTERMENT COMMITTEE FOR THE RAND.

SEVERAL important lessons may be learned from the success that has attended the "Safety First" movement on the Rand. In the first place, it shows that all the talk about the alleged hostility of the groups towards each other—which the Dominions Royal Commission apparently takes for gospel—is so much humbug. The "Safety First" movement is nothing if not a united, co-operative attempt by all the mining groups to reduce the accident rate on the mines, and neither trouble nor money is being spared to succeed in that object. The control and organisation of the movement is in the hands of representatives of the several houses, and the singleness of purpose and wholehearted nature of the joint effort put forth give the lie emphatically to the allegations of disunion among the leaders of the industry. A second and even more important lesson, however, is conveyed by the excellent result that has attended the "Safety First" movement. For, after all, accident prevention is but part and parcel of the larger "welfare" movement to promote safety and sanitation in the industry, to brighten and improve the conditions of living and generally to further the betterment of the worker's lot. This larger movement hitherto only vaguely realized as [illegible] on the Rand to ameliorate conditions, and tackled individually by each management or each group of mines with spasmodic enthusiasm, is now coming to be recognised as something that must be faced collectively and put on a broad-gauged, co-operative basis. In a word, such burning vital questions as housing, feeding, rates and methods of wage payment, recreation, holidays, and the rest that are connoted by the term "welfare work" can best be dealt with by the whole of the employers co-operating in sympathy, if the maximum results are to be attained. Moreover, not only is it enough to enlist the active support of all the employers in these things—the men on the mines must be attracted and their co-operation secured as well. That is the lesson of the "Safety First" success. A new spirit has of late crept into the ranks of Labour, and new methods must be adopted to meet the changed conditions. It is, of course, the same in industry everywhere else. All over the world, we saw that a few years ago the relations between employer and employee were of a most cordial character. Mutual interest and mutual service begot an affection which close intercourse cemented. Factory laws, compensation acts, wage and hour regulations did not then occupy the major portion of the time of the legislatures of almost every country, as they do now. The ancient question, "Am I my brother's keeper?" was answered then by a reference to the moral law—now it is answered by resorting to the statutes. Where once all was harmony discord has crept in. Instead of mutual interest we find mutual antagonism and hostility, created and increased by the indifference of the employers and the diabolical artistry of the politician and the labour mis-leader. In the light of these facts, the task should be to work unceasingly for a restoration of the harmony between employer and employee, so as to bring it to pass that they should be alike friends to each other and to the state. As Col. Pope, the President of the United States Association of Manufacturers, recently put it: "I believe the closer the relation is between employer and employee, the less intervening space there will be for discordant elements to creep in. If, by a new unionized sentiment existing exclusively between ourselves and our associated employees, we could get speedily rid of the reckless, mercenary and malevolent labour leader, with his gospel of distemper and his inflated ideas of phantom power; if, also, we could clear the deck of political medicine-men, with their noisy demagoguery and blatant claims; if we could awaken in the minds of the selfish and reversionary type of employer a quickening sense of broad, enlightened responsibilities—if, I say, these retarding elements could be eliminated by force of the united efforts of employers and employees, a new era of industrial order would be attained. Nor do I think this new era a dream. I believe the spirit of calmer outlook is broadcast in our land and that employees are beginning to critically survey and appraise the alleged claims of their so-called leaders. I would say that labour leadership is decidedly on the defensive in the eye of their own constituency. The promised land has turned out to be a wilderness. It is therefore the employers' time and opportunity to demonstrate beyond all cavil, that the best friend, the wisest protector, is the employer. That is the real, the ideal union. The burden of real, constructive progress is upon us. We cannot be reactionary; we cannot be radical. But we can, we must advance. We cannot ignore the problems of industry. We must face, study and attempt their wise, equitable, just solution. Let us turn off the heat and turn on the light." In that spirit, we believe, many of our problems should best be approached. The Rand wants an industrial Betterment Committee on the lines of those operating in the big American industries. Its scope would include everything that makes for the condition and contentment of the labour force, white and black. Its constitution need not differ essentially from that of the present excellent "Safety First" Committee. Its success could not fail to be proportionate to its increased opportunities and responsibilities. It would represent an organised effort of the employers to co-operate with the men in studying and securing necessary reforms, and its fruition would enable the industry to stand four square to all the incursions of the walking delegate on the one hand, and the criticisms of the seekers after disunion on the other. The suggestion is the obvious and logical outcome of the success of the "Safety First" Committee, coupled with the need of a more sympathetic study of welfare work and the desirability of the groups demonstrating their unanimity in removing even the mere appearance of cause for labour discontent.

THE MODDERFONTEIN MINES AND THE VAN RYN DEEP.

Calculations as to Total Tonnage and Life—Some Remarkable Figures—Value of the Further East Rand Not Yet Appreciated—Points for Investors.

The eyes of investors are still centred on the Further East Rand, and judging from recent developments in that interesting area, attention is likely to be concentrated on that section of the Witwatersrand for a good long time to come. All the mines there are achieving excellent results. The carrying of the resolutions at the special meeting of the New Kleinfontein Company, held during the week foreshadows an early expansion of operations at that property, which now embraces the Benoni Gold Mines and the gold section of the Apex, in addition to the Kleinfontein claims. The Van Ryn continues to earn consistent and substantial profits. Brakpan's June profit, despite the shorter running time, was £25,690 as compared with £23,184 in May. Geduld is earning profits at the rate of £100,000 per annum, with the prospect of early and substantial improvement. In the Springs Mines some good sections of ore are being opened up.

The "Modderfonteins."

But it is in the four "Modderfonteins" (New Modder, Modder B., Modder Deep and Modder Government Areas), and the Van Ryn Deep that interest is mainly concentrated at the present. These properties are all opening up in an extremely satisfactory manner and it is now clear that over a considerable area of the farm Modderfontein Nature has been as lavish in the distribution and concentration of the precious metal as ever she was in regard to the "golden mile" of the central section. In the case of both the Modderfonteins under Corner House control the working profit per ton is substantially in excess of the costs per ton. The Modder B. earned £35,433 last month, and the New Modderfontein £58,291. At the former property the new equipment, consisting of 16 Nissen stamps and one tube mill, is due to start working next month. At the New Modder development continues as satisfactory as ever, and as soon as the labour position and the general outlook justify such a step the crushing equipment will be practically doubled. In the Modder Deep Levels ore of high grade nature over a big width is being opened up, and work in connection with the construction of the initial milling plant is proceeding well. At the Government Gold Mining Areas development from all four shafts is proceeding satisfactorily and the construction of the 100 stamps plus 10 tube mills plant has reached an advanced stage. The Van Ryn Deep has gradually forged ahead until at the present it stands at the top of the list of the Barnato mines in profit, and still further advance is predicted. The outlook for lowering of costs in this vast annexe of the more Central Witwatersrand is at least as good as in other parts of the field, and this fact, considered in conjunction with the high grade nature of the ores worked there, encourages one in the belief that the real value of the Further East Rand mines has yet to be realised.

Advance in Share Prices.

The much improved aspect of the position on the Rand generally, and in the Further East section in particular, during the past few months has not been lost sight of in share market circles, and the following table setting forth prices for the four Modderfontein mines and the Van Ryn Deep at the beginning of March last and at the present time is interesting as showing the great improvement that has taken place in this Further East Rand area during the past five months:—

	March 2nd.	July 22nd.
Modder B.	£4 2 0	£4 9 3
Modder Deep Levels	2 2 6	3 3 0
Modder Government Areas...	0 19 9	1 4 6
New Modderfontein	12 0 0	13 10 0
Van Ryn Deep	2 2 0	2 6 0

But great as has been the advance shown in the foregoing, it can be safely asserted that an adequate appreciation of the probabilities and possibilities of the five mines in question has yet to come.

Tons per Claim.

With a view to demonstrating this aspect of the Further East Rand mines, we give hereunder some tables, which we think will prove of interest to a considerable number of our readers. The first table sets forth the gross reef-bearing claim areas and the net payable claims together with estimated average dips (as disclosed by development to date) and average stoping widths as given in the latest ore reserve statistics. From these factors can be calculated the tons of presumptive pay ore in the mines concerned on the basis of the stoping widths stated. After deducting a certain amount for sorting (in the case of the productive mines the sorting percentages of May are taken) the net payable milling tons per claim are arrived at.

Company.	Gross Claims.	Claims Deducted as Unpayable.	Percentage of Total Claims Deducted.	Net Payable Claims.	Average Dip of Reef. Degrees.	Stoping Width. Inches.	Gross Tons per Claim.	Sorting per Cent.	Deduction in Tons per Claim for Sorting.	Net Payable and Milling Tons per Claim.
Modder B.	1,400*	350	25%	1,050	14	55	25,190	10	2,519	22,671
Modder Deep Levels	377·5	56·5	15%	321	11	69	31,326	15	4,699	26,627
Modder Government Areas ...	2,633	658	25%	1,975	12	50	22,800	15	3,420	19,380
New Modderfontein	1,221	184	15%	1,040	20	62	29,326	9	2,639	26,687
Van Ryn Deep	764·5	114·5	15%	650	12	55	25,080	13	3,260	21,820

* Reef bearing.

Total Tonnages.

In the next table the figures arrived at in the last column are applied to the net payable claims, and after deducting the ore milled to date in the case of the three mines at present productive, estimates of the total payable and milling tons are arrived at. The figures under these headings are:—

Company.	Net Payable Claims.	Net Payable and Milling Tons per Claim.	Tons Milled to Date.	Total Payable and Milling Tons Remaining.
Modder B.	1,050	22,671	1,013,800	22,790,750
Modder Deep Levels	321	26,627	—	8,547,267
Modder Govt. Areas	1,975	19,380	—	38,275,500
New Modderfontein	1,040	26,687	1,260,000	23,194,480
Van Ryn Deep ...	650	21,820	410,146	13,773,551

The "Life" Factor.

There can now be ventured an approximate estimate as to the lives of the mines in question. In the following table the existing equipments of the five properties and the capacities of these equipments are stated. Where two rows of figures are given, the second has reference to projected equipments and capacities and the lives on the increased rates of exhaustion.

Company.	Plant. Stamps.	Plant. Tube Mills.	Capacity per Annum.	Life in Years.
Modder B. ..	80	5	420,000	54
	Nissens 16	1	600,000	38
Modder Deep Levels	60	6	360,000	24
Modder Govt. Areas ...	100	10	600,000	64
	200	20	1,200,000	32
New Modderfontein ..	180	7	630,000	39
	300	?	1,100,000	21
Van Ryn Deep	80	8	500,000	27

CAPITALS AND TOTAL PROFITS.

In the next and final table the capitals and share prices are given and an assumed rate of profit earning per ton is applied to the total tonnage. The resultant factor "Total Assumed Profit" is only intended to convey some rough idea of the profitable potentialities of the mines.

Company.	Capital.	Price of Shares.	Profit per Ton.	Total Assumed Profit.
Modder B. ...	£700,000	89/3	18/-	£20,511,675
Modder Deep Levels	394,500*	63/-	14/-	5,983,086
Modder Govt. Areas	1,400,000	24/6	6/-	11,482,650
New Modderfontein	1,400,000	£13¼†	17/-	19,970,308
Van Ryn Deep ...	1,196,892	46/-	14/-	9,641,488

* Issued. † £4 shares.

In the foregoing the profit per ton has been assumed at a figure which tallies with either the present rate of earning or the profit indicated by the value of ore reserves considered in conjunction with working costs and after due allowance for the Government's profit tax or taxes. We give the above figures with not a little trepidation, inasmuch as there are numerous factors of wholly conjectural value which have a vital bearing on the calculations. The profit per ton figure is one of these. We have not followed this variable factor through the tangle of considerations which determine it, such as the application of lower costs to low grade ore. Neither have we attempted to express any opinion as to the present worth and comparative values of the shares of the five companies dealt with. Those who are sufficiently interested can extend the calculations to such controversial matters for themselves. By way of conclusion we would point out that much of the eastern area of the Modderfontein B. is still unproven, and that our calculations in regard to this property may, after further exploitation, require considerable modification as indeed may well be necessary in the cases of the other four mines in regard to undeveloped areas. We repeat that the statistics advanced in the foregoing are only intended to convey some impression of the potentialities of the concerns dealt with, but the probabilities are that the calculations will ultimately be found to be not so very wide of the mark as some pessimistic critics may declare them to be.

LATEST RETURNS FROM S.W. TRANSVAAL DIAMOND FIELDS.

June Output in Detail—A Decreased Total.

The diamond output from thirty-three alluvial diggings in the South Western Transvaal during June was 3,549⅜ carats valued at £15,981 17s. 6d., as compared with 4,226⅝ carats of a value of £18,738 18s. during the preceding month. Of the eight principal producers, all but Kameelkuil and Kareepan 164 show a falling-off. The returns from the respective fields were as follows:—

	Carats.	Value.
Bloemhof	695¼	£2,616 4 0
Kameelkuil	333¾	2,417 15 0
[illegible] Hope	322½	2,005 15 0
Kareepan 164 ...	333½	1,470 3 6
[illegible]	410¾	1,433 12 0
Eastleigh	217½	1,039 17 6
Pandamstatie ...	248¼	769 13 6
[illegible]	187¾	695 14 0
Christiana	80½	484 5 0
[illegible]	81¼	357 0 0
Kromellenboog ...	41¼	280 17 6
[illegible] ...	59¼	226 13 0
[illegible] (portion [illegible]) ...	58	221 5 0
[illegible] ...	54¼	214 7 6
[illegible] 120	40½	211 10 0
[illegible] & [illegible]	38	206 10 0
[illegible] ...	35½	135 10 0
[illegible] ...	33½	134 10 0
[illegible] ...	21	123 0 0
Olivenfontein	39¼	120 10 0
Wildebeenderkraal ...	32	107 10 0
Goedgenoeg	13	102 12 6
Kareepan 137	13¼	73 0 0
Diamantdoorns ...	19¾	71 0 0
Beisjeslaagte	11½	69 2 6
Schweizer-Reneke ...	13⅞	60 10 0
Avondster	20½	55 0 0
Grootdoorns	15¼	44 0 0
Kaalpan 205	5½	33 0 0
Blesbokfontein	7¾	24 0 0
Honeyskop	6¾	19 0 0
Vaalbank	9	16 0 0
Maroetjesfontein ...	5¼	9 10 0
	3,549⅜	£15,981 17 6

The returns for the past half year have been as follows:

	Carats.	Value.
January	3,063¾	£12,318 5 0
February	3,838⅝	16,167 2 6
March	3,865¼	18,159 0 0
April	4,196¼	18,415 6 6
May	4,226⅝	18,738 18 0
June	3,549⅜	15,981 17 6
	22,739⅞	£99,813 9 6

Withdrawn from Phthisis List.

The Minister of Mines and Industries, under the powers vested in him by Section 2 of the Miners' Phthisis Act, 1912, has withdrawn the undermentioned mines from the list of mines published under Government Notice No. 1028 of 1912, in the "Union Government Gazette," dated the 30th of July, 1912:—Witwatersrand Gold Mines; The French Rand Gold Mining Company, Ltd.; Jubilee Gold Mining Co., Ltd.; Midas Deep, Ltd.; Salisbury G.M. Co., Ltd.; Sumner and Jack East, Ltd.; Ferguson Champ d'Or G.M. Co., Ltd. Heidelberg Gold Mines. New Heidelberg Roodepoort Tribute. Klerksdorp Gold Mines. Ariston Mines; New West Bonanza G.M. Co., Ltd. Section 2 of the Act reads that the Minister shall at the commencement of the Act frame a list of the mines in the Union where the mineral dust produced by mining operations is of such a nature as to cause miners' phthisis, and may from time to time add to or withdraw names of mines from such list. Most of the mines mentioned are either shut down or have been absorbed.

THE SOUTH AFRICAN TIN INDUSTRY.

Effect of Recent Decline in the Price of Metal—Transvaal and Cape Productions—The Market Steadier.

The price of tin has remained steady during the past week, Thursday morning cables advising the quotations on the London metal markets to be £143 10s. cash and £145 three months. These figures compare with £143 15s. cash and £145 2s. 6d. per ton for three months' delivery on Thursday of last week. It is probable that the serious depreciation in price that has taken place during the past few months has caused a small though noticeable restriction of production in some cassiterite producing areas, and this in turn has had the effect of steadying prices, and in fact improving bids for the metal. The price has thus nearly regained the position of May last, but it is still very much below quotations in the earlier part of the current year and in 1913. As recently as February last the price was £187 10s., whilst a little over twelve months ago tin was quoted at £232 per ton.

Effect on Local Mines.

It is interesting to note the effect of prices on the Transvaal's production. Last year the output was a record in both quantity and value, largely in consequence of the favourable opportunities existing throughout 1913, with the exception of the last two or three months of the year, for disposal of product at very advantageous prices. The highest quotation last year was in May, £232 per ton, and the lowest, £166 10s. in December. In the following table are set forth the essential figures relating to tin production in the Transvaal Province for the past four years:—

Period.	Tons.	Value.
June to December, 1910	1,766.500	£175,746
Year, 1911...	3,525.615	410,848
Year, 1912	2,932.208	367,699
Year, 1913	3,600.494	427,863
1913—July	286.828	33,401
August	294.990	35,600
September	272.190	31,555
October	328.160	36,109
November...	367.920	38,247
December	379.240	37,640
1914—January	366.557	38,613
February	334.880	34,056
March	355.067	34,492
April	409.920	37,353
May	319.740	25,956
June	390.910	34,329

Production Increased.

It should be remarked that last month's return, despite the unsatisfactory state of the metal market, at 391 tons of a value of £34,329 was 71 tons and £8,373 better than the May output, and should there be any decided move in price towards higher levels, it can pretty safely be reckoned on that the activities of our mines will respond rapidly. The tin industry of this country is now sufficiently well equipped to take full advantage of any real improvement in the price of the metal. At the same time it must be obvious that from the shareholders' point of view it is bad policy to attempt to make up profit lost through decline in price by increasing production. Such a course can only result in wastage of assets and must tend towards further lowering of prices by putting fresh stocks on an extremely sensitive market. In two or three recent issues we have dealt with this aspect of the tin mining business and have advocated a policy of conservation of resources and of development during the period of unfavourable prices. The effect of recent declines in the price of the metal on Transvaal and Swaziland mines has been only too evident. Thus the Swaziland Tin Company has had to pass its dividend, and the June profit resulting from the output of 33·768 tons of concentrates with metal at an average price of £137 15s. per ton was only £518, whereas in the year ended with June, 1913, a profit of nearly £25,000 was secured. The Zaaiplaats Company, too, in the year ended with July 31st, 1913, earned a profit of £72,811, but for June, 1914, the earning was £2,879. A further indication of the depressed state of the Transvaal tin industry was the sale the other day of the Farm Salomon's Temple, on which £100,000 has been expended and from which tin of a value of close on £3,000 had been shipped up to the end of 1911 for only £1,500.

Cape Colony Outputs.

In the Cape Colony production on a small scale still continues. The Kuil's River area is, of course, much more favourably situated in regard to a port of shipment than the Transvaal mines, but the outputs remain at very low figures. Perhaps a return to higher levels in regard to price would be signalised by larger production from the cassiterite deposits of the Cape Peninsula. Recent outputs and shipments from the Cape have been as follows:—

Period.	Tons.	Value.
June to December, 1910	8.000	£995
Year 1911	8.114	1,023
Year 1912	—	—
Year 1913	71.413	8,687
1913—July	16.324	2,072
August	11.400	1,496
September	—	—
October	9.898	1,209
November	11.032	1,178
December	9.111	974
1914—January	—	—
February	3.136	367
March	8.008	902
April	6.805	704
May	3.038	181
June	10.850	1,084

Indimba (Swaziland) Tins: Two Monitors at Work.

THE PETROLEUM DEPOSITS OF SOUTH AFRICA AND THEIR VALUE TO THE EMPIRE.—II.

[By James Cumming.]

It must be apparent that in Mexico, in Persia, in Venezuela, in Madagascar, in which foreign countries such enormous amounts of British capital are being invested in securing rights over petroleum-bearing properties, there has continually been, and still is, a perennial danger in the forms of revolutions, civil and other wars, and continual changes of government. Here, in South Africa, to-day, such dangers have ceased to exist, but the absolutely vital necessity for Great Britain to get a firm hold at once on every Transvaal and other South African deposit of such a safeguard as petroleum, the fuel of the future, is patent. The mineralogical and geological points on the occurrence of petroleum in Canada (quoted above from Mr. F. J. Sur's report) precisely coincide with those which occur throughout the South African petroliferous formations—especially in those most valuable zones which Mr. Craig did *not* visit. In his report Mr. Craig grandiloquently says that he covered 2,700 miles by motor car, 150 miles by Cape cart, and 25 miles on horseback, while in hilly country short expeditions were made on foot. What does a real prospector think of such a remark? Mr. Craig goes on to say that "erroneous ideas with regard to petroleum exist, not among persons with technical or scientific knowledge, but among a certain class of prospector, and the general public." The original prospectors and pioneers of this country did not luxuriously travel by motor car, or Cape cart, or on horseback, and they did not make "short expeditions on foot." They did the whole lot on foot, and in such luxurious surroundings as Mr. Craig experienced it is small wonder that his examination of the country was so superficial. Not only petroleum, but minerals generally have a habit of locating themselves where only the man on foot can get at them. Mr. Craig (on his own showing) never left the beaten track, and he admits that his investigations were "confined to the formations in which possibilities of the occurrence of petroleum were (already) believed to exist." He only visited localities within easy reach, which had already been discovered by the "mere prospector," whom he dares to affect to despise. What he says about "persons with technical or scientific knowledge" is all very well, but there is little to show to the credit of the mere scientist, in the way of mineral discovery, throughout South Africa. And it has been the same all the world over. California, Australia, Calgary, Cobalt, Pilgrims Rest, Lydenburg, Barberton, Kimberley, Premier Mine, the Witwatersrand itself, were not discovered by motor car travelling or by "persons with scientific knowledge," but by "the prospector" who professed nothing, but had the great essential for success—sublime optimism! The scientific geologist is much too parsimonious with his science, and his temperament is widely different from that of the prospector. Had South Africa depended in the past on the mere scientist it is more than doubtful if her magnificent mineral resources—as already proven—would ever have been discovered; and her future welfare in such hitherto unknown propositions as petroleum depends on the prospector and the investor—not on the scientist. The latter comes and goes, his only endeavour is to prove a negative; while the truly sublime temperament of the patient "prospector of a certain class" carries him on, heedless of the book tenets of the arm chair or luxuriously fitted out geologist, and the prospector scores in the end. He looks into everything. He is perfectly aware of certain rigid natural laws, and he tries neither to evade nor to oppose them, but he also knows that, like medical doctors or lawyers, even geologists differ—and sometimes, even often, he finds what he is after just where the geologist, the mere book-savant, says it cannot possibly exist! Two cases in point—a quarter of a century ago N. M. Hewitt, a Queensland gold mining "expert" made a bet, here in Johannesburg, with John Charlton, that the "banket" formation could not continue to a depth of 100 feet! What would he say to-day if he saw the "banket" reefs at 5,000 feet vertical and 20,000 feet on the incline from the outcrop? More recently another so-called expert has attempted to condemn other South African mineral propositions, and his mere theories are being rapidly disproved by the practical work of the "mere prospector." It may at once be readily granted that the world owes an enormous debt to such giants in science as Roderick Murchison, to Lodge to Crookes, to Humphrey Davy, to Huxley and Thompson and Darwin; but how much more do we owe to such mere prospectors in the world of industry as the uneducated and illiterate James Watt, George Stephenson, and countless others? South Africa diamonds and gold and coal were none of them discovered by "scientists," but by such hardy prospectors as Mr. Craig ventures to disparage; and in the near future it may be confidently predicted that South African petroleums will triumphantly discredit Mr. Cunningham Craig's superficial survey. In Johannesburg a Madagascar petroleum proposition has recently been floated, to exploit 130 square miles of oil-bearing ground—under the title of the "Betsiriry Proprietary Oil Fields Company"—at a distance of 80 miles from the coast. Three boreholes have been put down to various depths up to 1,150 feet, and "seepages" of petroleum occur on the property. Oil-saturated sandstones also occur, with deposits of oil-shales or clays (decomposed shales). The object of the company is to trace the "seepages" to their source, as at present the petroleum only oozes slowly from the saturated sandstones as a dark, viscid substance, frequently appearing as a solid black asphaltic mass; but the mineralogical formation is of a similar nature to the various petroliferous formations of the Wakkerstroom and other oil-bearing districts of South Africa. Sandstones and shales alternate in the various boreholes so far sunk, and the rock-pressure is so great that although there is an inflow of water equal to 500 lbs. to the square inch, the oil rises to the top. Wiring from Madagascar, the resident engineer and "oil-fields geologist," at Sakalava, has recently made one or two wise remarks, and one egregiously fantastic statement. He says that the anticlinal structure there constitutes "a most favourable indication as to abundance of petroleum springs and asphalt." So far as indications, pure and simple, go, he is correct, but (and this is a big "but") he apparently has nothing more than "indications," yet he goes on to say that "success is a foregone conclusion, provided that the deep oil-bearing formation is covered by a thick impervious bed." What proof is there of any oil, at depth, beyond the anticlinal structure? And if there is any oil visible at present, how can it be covered, at depth, by a "thick impervious bed"? But, in any case, why expend British money in the French island of Madagascar, in a problematical search for what *may* exist, instead of investing it in what we *know* exists within our own borders, and which is only awaiting development? Apart from even patriotism, the commercial instincts of we Britishers and South Africans should revolt at the bare idea of spending our money in the development of foreign oil-fields, with only foreign security of tenure and with the risks of war, when we have such illimitable sources of supply at our own back-door. There is an old saying that "distant fields are always greenest," but the above-quoted telegram from the Sakalava field in Madagascar (26th June, 1914) is an object-lesson as to preferability of investing in petroleum propositions in our own territory, upon which we can keep an observant eye. Here, too, in South Africa we have other vast petroleum resources besides our great oil-shale deposits; and as showing the enormous scope existing for the development of a great petroleum industry in the Transvaal and North-Eastern Natal, it may be mentioned that the British Government have had under consideration, for months past, a scheme for distilling oil from British coal, so as to further eliminate the necessity for the use of foreign petroleum. It is calculated that from one British coalfield alone, 400,000 tons per annum of excellent oil for fuel purposes can be produced, and the distilling process has already been most successfully employed on a commercial basis. When this scheme is completed, not only will the British coal supply be dealt with in a greatly more economical manner than hitherto, but a large increase of employment will be given to British workers. This applies to the possibilities of the production of petroleum from coal refuse in South Africa, so as yet further to "eliminate the use of foreign petroleum." Anyone who has travelled through the great coalfields of northern Natal, and the Transvaal, must have been struck by the spectacle of the enormous "dumps" of "refuse" at the pitheads of every colliery throughout the coal-producing areas. These "dumps" consist of millions of tons, and up to date the only desire of colliery-owners and managers has been to get rid of them by burning! Yet, in petroleum, in naptha, in tar, in oil-spirit, in sulphate of ammonia, these "waste dumps" contain potentialities of the greatest commercial value. If from one British coalfield alone, 400,000 tons of excellent oil for fuel purposes can be extracted, it is safe to say that from her similar resources South Africa can also produce enormous quantities, and what a market we should then have for naval and other shipping purposes, and for export—especially to our geographical natural markets, the Far East and Australasia.

THE MANAGER AND STAFF OF THE CITY DEEP NEW CIRCULAR SHAFT.

Manager, Members of the Staff, and Sinkers, New Circular Shaft, City Deep.
Inset: View of Circular Shaft Headgear.

The Half-Year's Dividend Harvest.

The total dividends announced by mining concerns operating in the Union of South Africa for the first six months of the current year are estimated at £5,159,561. Of this total Transvaal gold mines easily head the list with £4,212,950 as against £4,164,141 in the first half of last year. In regard to other mines a falling off in distribution is noticeable, attributable in the case of diamonds and tin to market vagaries, and in regard to collieries to recent industrial unrest. Thus, for the half year the declarations of diamond companies amount to £722,810 as compared with £1,425,917 in the January-June period of 1913. The distributions of the tin mines are reduced by £12,000 to £10,500, whilst collieries pay out £144,719 as compared with £160,969; and copper mines £38,582 in comparison with £64,948 a year ago. All these industries are, however, in a flourishing position, and it is not unlikely that operations during the remainder of this year will make up such leeway as has been lost in the first six months.

THE ECONOMIC USE OF WORKMEN ON THE RAND.—I.

An Impartial Investigation of an Outstanding Present-Day Problem of the Industry.

(BY EDWARD J. WAY.)

A great deal of thought has been given to the choice of a subject upon which to address you on this occasion. In looking up the past history of the Institution, and of the societies which were brought together to form it some three years ago, it is found that many most interesting and important subjects have been dealt with in so able a manner that the field is somewhat narrowed and the matter to choose from is not abundant. But such special interest attaches at all times to labour problems that it is thought that the Economic Use of Workmen, as far as it concerns the mines of the Witwatersrand Gold Fields, might be investigated. I am afraid that it will be impossible to avoid controversy, and it is not expected that you will all accept the views about to be expressed; but it is one of my privileges on an occasion of this kind that I may choose my own subject and state my views without discussion, and however imperfectly the subject may be dealt with, such views are given in the hope that they will arouse something more than passing interest. First of all it will be necessary to define what is meant by the expression "Economic Use of Workmen." It means the scientific and wise application of working men in order that they may succeed in securing what is necessary for the satisfaction of all their reasonable wants at the same time ensuring their best efforts for the employer. Labour in this country differs from that in European countries in that there is the demarcation brought about by the radical difference in skin colour. If we use this line of division, workmen consist of two races which for the purposes of this address may be divided into: (a) White; (b) Black (including the coloured off shoots generally known and regarded as "coloured"). Custom, prejudice and general history, apart from other things, have always given whites predominance over blacks, and although occasionally the blacks have risen against this dominance, they have always been defeated, and have acknowledged, outwardly at any rate, the predominance of the white skinned races. And their respect for the white race varies almost directly with the colour shade of the master. The native will outwardly show the greatest respect for the average white man, less respect for an olive-skinned man, and as the predominant race becomes of darker hue his respect is replaced with a corresponding amount of contempt.

Dr. A. Caldecott, in "The London Quarterly," discusses this question, and "The South African Mining Journal," May 9th, 1914, gives some interesting extracts from his essay:—"Is there, in fact, a single Human Race? Or is Humanity, in truth, only a name for a group of different races?" asks Dr Caldecott. "Man never knew so much about himself as he does to-day. Both on the physical side and on the mental, physiology and psychology have advanced by improvements in their methods no less than by vast enrichments of their material, and the comparatively new sciences of anthropology, ethnology, and sociology have taken their places as studies of university rank. It is for us to ask what is their answer to our present question." Dr. Caldecott then goes on to discuss the importance of the various differences between the two races, and physiologically it has been found after prolonged and highly specialised research that there are no substantial differences in the fundamental structures or functions of the body between European and other races. It is found by medical science that all races react to drugs in approximately the same manner, and are susceptible, within minor variations, to the same diseases. (Mr. Way proceeds to quote further from Dr. Caldecott's article.)

It is evident from the foregoing that "colour" is the only difference between the black and white races. What, then, is the distinction between white and black labour as far as the Witwatersrand is concerned? It is largely of our own making. The Mining Industry at an early period endeavoured to form an aristocracy of white labour. It was an attempt to separate the two races and to differentiate between them solely upon the basis of colour. It was considered derogatory for white and black to work at the same task side by side. The white man throughout was set in a position of supervision, and the manual labour and menial work were, in every instance, relegated to the native. The history of the early days of mining in the Transvaal shows that a white man was expected to look after the work of a gang of natives four or five times larger than that placed under him to-day. And the attempts of the industry, backed by the Government in the Mining Regulations, literally to enforce the superior position of the white man, have been rendered abortive owing to the acts of Labour Union directors since 1907, and more particularly in 1913 and 1914, when well known leaders, in spite of these well-meant but mistaken wishes to differentiate distinctly between the races, have, in public meeting in my hearing, called the native workers "men and brothers," and urged them to come out on strike for higher wages. Even more recently, and it is not necessary here to dwell upon the subject, distinct attempts have been made to bring the native worker into the white man's labour unions. Surely the words of Shakespeare can be put into the black man's mouth:—"The villainy you teach me I will execute, and it shall go hard but I will better the instruction." ("Merchant of Venice," Act III., Scene I.) Therefore it would seem that consciously or unconsciously the white workman of this country is himself proving the findings of Dr. Caldecott, which I have given above, and which are, in effect, that all men, of whatever race or colour, are equal, if equal in brain and muscle. In general economics we must examine the position of the white and of the black man. The early history of native mine work in this country shows that the native is docile and adaptable, and that he is indispensable. I can recollect in the early days of the Pilgrim's Rest fields (I speak of 1887) the time when natives worked for 10s. to 30s. per month from sunrise to sunset every day, except Sunday, their food being a ration of mealie meal and salt, and a little meat once a week. They had no specially designed compounds. A native was turned out with a sickle to cut grass, and given three days to build his own hut. They were contented, wonderfully free from disease, and recruiting was unnecessary.

Workmen must be voluntary and contented. It is not to be denied that there may be means at command to cause the natives to come voluntarily, but the object must be to make them contented at the same time. In dealing with the present position on the Witwatersrand Gold Fields many other considerations must be taken into account. The standard of living for the native with the progress of civilisation has been raised. His demands for amusement and better food have become insistent, and unless labour in any form be made attractive it is very difficult to get the workman, whether he be black or white, to come and undertake it. And we must recollect that as the years pass on, the native, in the ordinary courses which are tending to elevate him through his understanding of the word "work," will, in the hours when his labour is finished, demand more consideration for the relaxation and amusement which are so abundantly at the command of the white man. The extraordinary formation of the gold-bearing beds of the Witwatersrand led to the construction of mine works practically in one continuous line for some fifty or sixty miles, each mine being practically adjacent to the next. Thus a large population, both black and white, has been got together in a comparatively small area, which is a most uncommon occurrence in mining, since, usually, mines are isolated or, at any rate, situated at some distance one from another. This contiguity has been the cause of many things which have been disastrous to the mining industry itself. The herding of natives in closely-built compounds has been adverse to their health. They have been more easily attacked by panderers to their vices, and the drink question, which could be dealt with effectively in isolated areas, has here remained a very difficult problem. The inducements to work have been of a fixed nature, since, with very few exceptions, the native, who does a good day's work, has little or no hope of advancement. He sees the white man, who does little hard manual labour, reaping almost the entire reward; and until these things are changed, and the native is remunerated in exact proportion to his efforts, the difficulty of obtaining this labour will remain. The only remedy is that white and black shall have equality of opportunity, and the better man must win in the long run. It is thought that pride of race will do a great deal now and in the future to secure predominance for the white man if he be put in competition with the native with a fair field for both. But it must be borne in mind that the black man also is not devoid of pride of race. Before going further, it will be necessary to define the exact meaning of the word "labour." Labour may be either physical or mental, and the effort must be for some useful end. It means the exertion of mind and body power for some end other than that of recreation or sport. Work or labour in the sense meant here must be for gain. Professor T. Eley, in his introduction to "Political Economy," says, "when labour becomes soulless, ceasing to minister to the fullness of life, increased opportunities for development outside of the industrial field must be offered, and it is this dissatisfaction which leads to differences between employers and employed." The earliest note of strife between capital and labour is recorded in the fourteenth century, A. H. Welsh, "Development of Engineering," Vol. I., chapter 4, page 169). In "Paradise Lost" Milton says:—

> "Man hath his daily work of body or mind
> "Appointed, which declares his dignity."

We have heard a great deal in this country of the dignity of labour, that is, the dignity or want of dignity of hard manual work, toil in the fields, work upon the roads, where the muscles of the body during working period are exerted to a reasonable limit. This is work or toil as understood in European countries. But owing to the attempts of the industry in past days to keep the white man as an aristocrat, how many white men to-day do a day's work in that sense on these fields? They leave it entirely to the black man, and the black man does not get a comparative reward. Does the white worker in this country think that the black worker is going to remain passive to the end of time with regard to this matter? We have only to look back into history to judge how savage races have emancipated themselves and established a position. Imitation, emulation and ambition are the keys which gradually open the doors to the anthropic species, and we know, without unnecessarily going into details, how races have at times risen from savagery to the height of then known civilisation, to fall off again through the love and abuse of luxury. But it is strange that history records no case of a people actually descending to the original level and again becoming mere savages. Custom, the force of example, and restraining laws, have prevented this. What has taken centuries in other countries has been taking place in this country in our very midst during the past fifty or sixty years. Can any force exerted by the white races, short of extermination, prevent the civilisation of the coloured

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* Presidential Address read before the S.A. I. of E.

peoples? The reply is that no such force exists, and as extermination cannot be considered, how can we meet the position? Only in one way. By granting what I have said before—equality of opportunity. What does this mean? The barrier of colour, as far as work is concerned, will disappear in the years to come—many years, may be—but it will disappear because it is a false barrier. We find this already to a certain extent in India, where the cultivated high-class Indian very nearly holds his own. All this is in the womb of the future, but it will be on a basis of brain and pride in labour plus muscle against brain and pride in labour plus muscle in both cases, and the stronger will hold sway, whichever race it may be. The white man is to-day superior in all respects to the black and coloured, and he must maintain supremacy. The result will not be achieved by despotic methods. Forced labour has always ended in disaster, and the nearest approach to free labour in our own times is exemplified in the work at Panama and Kimberley, and on the Witwatersrand Gold Fields, and even then in some instances the methods are open to criticism. Maurice Evans sums up his view of the position of Black and White in the following manner:—(1) The white man must govern. (2) The Parliament elected by the white man must realise that while it is their duty to decide upon the line to be adopted they must delegate a large measure of power to those specially qualified, and must refrain from undue interference. (3) The main line of policy must be the separation of the races as far as possible, our aim being to prevent race deterioration, preserve race integrity, and to give both opportunity to build up and develop their race life. (Black and White in South Africa," chapter xi., page 310.)

(To be continued.)

INDUSTRIAL BETTERMENT ACTIVITIES IN THE U.S.A.

The pamphlet issued by the National Association of Manufacturers on Industrial Betterment, entitled "Industrial Betterment Activities," is of great interest and value. About five years ago the periodical published by the Association began the issue of articles explaining methods and appliances for the prevention of accidents. It may be that the interest of manufacturers in this subject was quickened by the enactment of laws, by one State after another, throwing on the employer the pecuniary responsibility for injuries to their employees. But whether this be the cause, or a mere coincidence, the work which the Association has been doing in showing how the lives and limbs of the working people can be protected is worthy of the highest praise. This pamphlet begins with a list of speakers available for addresses on industrial betterment, and especially accident prevention, and workmen's compensation. Local associations of manufacturers, lecture bureaus, churches, Young Men's Christian Associations, and other organisations can get the addresses of speakers in their own vicinity who are particularly qualified to speak on these subjects. This is followed by a description of motion picture entertainments calculated to show safety appliances at work, and the methods of careless workmen which have cost many a man an arm, or a leg, or his life. The films show machinery, operated without, and then with, devices to prevent accidents. There is a list of lantern slides. One of these illustrates the distribution of responsibility on a diagram, according to which 43 per cent. of the accidents are due to the "hazard of the industry," 17 per cent. to faults of the employers; a little less than 30 per cent. to the fault of the workers, and a little over 10 per cent. to the faults of employers and workers, jointly. They show positions and methods that are dangerous, safety devices fitted to machines, and statistics of accidents in several foreign countries. All are calculated to teach carefulness and to illustrate methods of promoting safety. The pamphlet contains a bibliography on accident prevention and workmen's compensation, a description of the safety engineering department of the National Association of Manufacturers, and another of the travelling exhibit of the accident prevention department. Of late much public attention has been directed to this humane work of the National Association of Manufacturers, and to the various methods of educating workmen, which are supplied by the Association without compensation. A general use of them will save the lives and the earning capacity of thousands of men who are constantly exposed to danger, and whose very familiarity with danger tends to make them careless. It will also encourage manufacturers to equip their machines with the safety devices which other manufacturers are using.

Seta Diamonds.

Active operations are about to be started in the Seta Mine, which was closed down some time ago for lack of funds, writes the Messina correspondent of the Zoutpansberg paper. There is a considerable amount of over-burden to be cleared away, when it is expected that the quality of the diamonds found will improve. The newly-appointed manager and his assistants have passed through on their way to the mine.

Otavi Mines and Railway.

A cable from Berlin, dated 3rd July, states that the Board of the Otavi Mines and Railway Company has presented its report and balance-sheet for the year ended 31st March last. The gross profits amounted to 6,081,473 marks. After deduction of the amounts written off for depreciation and transferred to the reserve there remains a net profit of 3,852,691 marks, out of which a dividend of 5 per cent., equal to 1 mark per share, is declared, as well as an extra dividend of 8 marks, or, in all 9 marks on the Ordinary and 8 marks on the Deferred shares. The report states that production had increased and that ore shipments also showed improvement. The main vertical shaft had been brought down to the 6th level, at a depth of 160 metres, and development work had been started on the sixth level. The ore developed shows as good values as on higher levels. Profits from the railways showed further increase.

General Gorgas Anticipated: The Native Compound at Leeuwpoort Tin Mine.

STEEL TRUST PAYS £1,100,000 A YEAR FOR WELFARE WORK.

This Large Sum is Devoted to Increasing the Safety and Bettering the Condition of the 200,000 Employees, and the Corporation Finds That It Pays.

[illegible] item which it calls "welfare work" the United States Steel Corporation spends, roughly, 5,500,000 dollars a year. In so far as it can be set down definitely in a table of accounts and balances the corporation pays out every year the sum of 5,450,000 dollars for which it receives in return not one cent. In addition to [illegible] the corporation spends that amount for its employes. But if, walking along lower Broadway some morning, you should meet one of the "steel men" and should ask him whether the welfare work, from a practical viewpoint, was worth keeping up and whether it paid, he would have no hesitation whatsoever about answering you. "Pay!" the steel man would echo. "Pay! Well, I should say it does pay. Worth keeping up? Well, we're spending more and more each year on it. Practical? It's practical down to the last cent!" In its mills and in its mines, its railroads and its boats, the United States Steel Corporation employs 200,000 men. Its various "communities" number in all about 600,000 persons. The 5,500,000 dollars put down to the credit of "welfare" in the corporation's books goes to these 200,000 men and their families, to safety devices and the prevention of accidents, to the care of the men and their families when accidents occur, to sanitation in mines and mills and in the workers' homes, to pensions for superannuated employes and to stock-sharing for men at work, to shower baths and children's playgrounds, to special schools and to the examination of water supplies—to all the hundreds of details that make, as one of the corporation's bulletins reads, for "improving the condition of workmen."

More than one-third of the sum now being spent for the corporation's workmen goes to the care of injured men and the maintenance of their families. With all the safety devices that have yet been invented the making of steel is still a dangerous business, in which a slight carelessness may exact a heavy penalty. For the relief of men injured and the families of men killed the corporation spends 2,000,000 dollars a year. Some of this is the compensation that the law demands; oftener it is far more than that. For the corporation's welfare committees assume responsibility for the care of injured workmen and their families in all cases, regardless of legal liability. And only in approximately one-fifth of 1 per cent. of all the accident cases last year were suits brought against any of the steel companies. For sanitation, home care, general hygiene, and the [illegible] unclassified details as [illegible] schools and children's playgrounds and flower seeds and fences and swimming pools, the Steel Corporation spent last year 1,250,000 dollars. And that side of the big Company's "welfare work" is just beginning to be touched. The installation of shower baths and tiled dressing rooms is in itself an expensive business.

ACCIDENT PREVENTION.

Representatives of the Steel Corporation are of one voice in declaring the companies' system of accident prevention to be the most effective in the United States. To keep up its system the corporation spends not less than 750,000 dollars a year. It spends 750,000 dollars more on pensions. And although the Employes' Stock Subscription Plan is carried out not for the gift but the sale of the corporation's stock to the employes, it costs the Steel Corporation 750,000 dollars a year. "I think that the Steel Corporation does more work of this sort than any other organisation in the United States," said Col. H. P. Bope, First Vice-President of the Carnegie Steel Company. "Of course we must do a big work because we are a big concern, and our problems are big problems. The Carnegie Steel Company alone employs 30,000 men. At our Homestead plant there are 10,000 workmen, and the capacity of the mills is 8,000 tons of steel a day. So it isn't surprising that we spend more than any other concern on welfare. The welfare work is, frankly, both philanthropic and economic. It is in line with the growing social responsibility of the present day, and it tends, of course, to build up a stronger and more efficient as well as a loyal set of workers. It isn't charity, but we hope it's neighbourly. At least 15 per cent. of the employes of the corporation are stockholders."

TWO PARTS OF THE WORK.

"There are two parts of our work in the prevention of accident," said C. L. Close, manager of the Corporation's Welfare Bureau. "There's the part that is only our part—the installment of safety devices and the planning of plants and machinery so as to minimise danger. And then there's the part that is both ours and the men's—the education of the workers themselves to care and prudence. And that's much the harder of the two! As a corporation we have been working for the prevention of accidents for six years. We feel now that, although there are always new suggestions and improvements, we have already done the major part of the work of safeguarding our plants. At present our biggest work is in teaching the men to do their part—to use the devices we have provided, and to take care of themselves. "The United States Steel Corporation definitely took up the work of accident prevention in 1906. Up to that time the various subsidiary companies put forth individual efforts, but no systematic work had been done by the corporation as a whole. In May, 1906, the corporation called a meeting of the casualty managers of all the companies, and from this and later meetings was developed the Committee of Safety. The principal duty of the committee was to perfect a plan for inspecting the different plants and works with reference to the best methods of preventing accidents, to act as a clearing house for suggestions and reports, to select inspectors to look after safety work, and to make recommendations for the prevention of accidents to the various companies with the request that reports be handed in to the committee as soon as possible. The committee immediately put a system of inspection into operation, selecting men familiar with the machinery and sending them to examine the different plants. They were men who had enough experience to make them expert in detecting sources of danger. They are also quite competent to suggest means for the avoidance of danger. These men make full reports and call attention to even the smallest sources of danger—such as worn floors, carelessly piled material, uncleaned windows. The committee always requests the company to report within thirty days what action has been taken on the inspectors' recommendations. So you see they waste no time about it! The subsidiary companies themselves have safety committees now, in addition to the general committee. Then there are special safety committees in practically every plant of practically every company. These organisations differ somewhat, but the plan is usually to have a central committee made up of important officials from each of the plants, to meet monthly at the company's head office; a plant committee made up of Superintendents, master mechanics, and safety inspectors, holding at some plants weekly and at others daily meetings; and a workmen's committee chosen from the rank and file of the mill. The duty of these committees is to look after defects either in buildings or equipment, to watch out for unsafe practices by the workmen and to report any other conditions that might possibly cause accidents. The make-up is frequently changed, with the result that in time every man in the mill will have been a member of a committee. The men are made to understand that when they have served their term on the committee they are still expected to make suggestions. The men's suggestions are pertinent and helpful and we are quick to adopt them. The first thing we did was to look out for the obvious safeguarding of the machinery. We have put guards over all our gear-wheels, have covered all the chains and machines. Every detail is looked out for. For instance, our planes and box saws are so covered that it is impossible for a man to cut his hand in them. Our men have masks and screens and safety goggles. Of course in the newer mills and equipments we

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install safe machinery in the first place. The older plants have been made safe. Altogether we have spent 4,000,000 dollars for safety devices in six years."

SUGGESTIONS FROM WORKMEN.

"Hundreds of suggestions come from the men themselves. For instance, there is the stethoscope to test machinery for crocks, just as doctors test people's lungs. They are always thinking up something and reporting it to the committees. And the committees adopt the suggestion and give the men prizes."

In front of every employment office of any of the companies is posted, in six languages, the statement that careless men will not be employed. Over the entrance of every "works" is a "rule of safety," in several languages, illuminated at night, changed often and inescapable for every man who enters the mills or passes the gate. Every mill fairly bristles with danger signs—if there is a workman overhead, if a man is in a boiler, if men are at work on tracks—in all the hundreds of cases where care is necessary signs are posted. This Fall a new idea has been evolved to simplify the danger signs—the red ball that means "Look out."

"We would need about thirty-two copies of each sign, every one in a different language, to reach all our men," Mr. Close explained. "And even then there are thousands who can't read at all. So we have adopted the red ball as a danger signal. If the explanation can be read all right; but if it can't a man still knows he's to get out of the way."

As a result of the corporation's safety work and the annual expenditure of 750,000 dollars for the guarding of its men, the serious and fatal accidents in the corporation's mills and mines have been reduced, since 1906, 43 per cent. Reduced to the terms of humanity, this means that there are something more than 2,300 employes escaping injury to-day who would have been seriously hurt or killed under the "normal conditions" of six years ago. The fatal accidents in 1911 were a little more than 27 per cent. less than in 1910.

CARE OF INJURED MEN.

The welfare bureau's expenditures for the care of injured men come under another item in the welfare budget and are listed with the annual 2,000,000 dollars for "relief." Every mill and mine in the steel corporation has not only its band of men who are constantly on the look-out for the prevention of accident, but its trained corps of "first-aid" rescue workers. A man who is hurt in the plant of the steel corporation is taken at once to the emergency hospital for examination. If his injuries are slight he is cared for there and taken home: if he is seriously hurt he is sent to a large hospital. Some of the companies have their own big institutions; more send their injured men to hospitals in the nearest city, where the corporation pays their expenses until they are well again. Meanwhile the company looks after the sick man's family. The corporation's systematized plan of relief for the families of men killed or injured went into effect in May, 1910. It is similar to the provisions of the workmen's compensation laws now active in fifteen States, but it was put in operation before any such laws had been enacted in the United States. Its expense is borne solely by the company, and of the entire amount expended last year in casualty matters, 80 per cent. went to the families of injured men.

"A recent general investigation in New York State showed that where there was litigation only from 30 to 40 per cent. of such funds went to the men and their families," commented Mr. Close.

THE SANITATION WORK.

The sanitation and general home welfare of the Steel Corporation's "welfare plan" has just begun. It costs, at a minimum estimate, £1,250,000 dollars a year. To the outsider to whom the technicalities of safeguarding machinery mean little, the most interesting feature of the welfare work is this inclusive effort to safeguard the workmen's health.

"And this is the feature of our work for which we are most unable to show returns," said Mr. Close. "When some one asks me how it pays us to put in baths for our men and playgrounds for their children, I can't exactly tell him. And yet you know, and I know, and everyone knows that the man who takes a bath every day is the efficient man, and the child who has a place to play is the child who will grow up to be efficient."

And so the Steel Corporation is gradually installing shower baths in all its mills and mines. It is fitting its buildings up with rooms where the men, begrimed with the work of the day, may go to their lockers and change their clothes, and then go home all spick and span to their little cottages. It is putting sanitary drinking fountains in the plants. It is opening swimming pools, in some places gymnasiums and club-houses. It is selling meat and vegetables where there are company stores in buildings screened from roof to floor, presided over by men clad in spotless white clothes, and fitted up with sterilized marble counters. It is—and this is in itself an immense undertaking—investigating the sources of every water supply for every one of the corporation's mills. "And there isn't an epidemic in any plant of the Steel Corporation," declared Mr. Close; "there hasn't been one since we started our sanitary work." The corporation's representatives examined last year 2,300 sources of water supply. A new ruling requires the water supply of every mill and mine to be examined at least once a year. In the past few months the corporation has begun to employ district nurses to visit the workmen's homes. These are not in any way connected with the work of the emergency hospital and relief corps. There are nurses as well as surgeons in all the mills, but the district nurses confine their work solely to the workmen's homes. They teach the housewives how to care for the homes and their children, and how to take care of any sickness, and do all they can for the health and cleanliness of the household.

FLOWER GARDENS AND BACK YARDS.

When the companies were considering the general welfare and sanitation, someone thought of giving garden plots to families, sending out flower and garden seeds and offering prizes for the best kept yards. It would help keep the communities clean and in good order, it was argued, would give the men and their families a pride in their homes, and would provide a recreation activity that was neither saloon nor dance hall, and that had the great additional benefit of being out-of-doors. So prizes of twenty-five, fifteen, and ten dollars were offered in the majority of the mills, and the corporation villages blossomed forth beautifully. The offer of the prizes and the gift of the seeds did all they had been expected to do. And they did something else of which no one had thought. They brought down the cost of living. In the past year it is estimated that the workmen in the corporation's coke district alone saved and earned 200,000 dollars by their kitchen gardens. They didn't have to buy vegetables; and when they had more than enough for themselves, they sold them! The special schools for the instruction of salesmen, superintendents, and foremen, and the classes for the training of "first aid" corps, may also be listed as "general welfare" plans. The Carnegie Steel Company, for instance, has a class of six young men taking courses leading to promotion as salesmen. Other workers are being trained for places of authority as superintendents and foremen. In the mills the "first aid" workers are trained under experts.

Is Prospecting a Lost Art?

Speaking at the meeting of the Transvaal Estates and Development Co., recently, Mr. F. J. Dormer said, in alluding to the holdings of the company, they had always "frankly acknowledged at these meetings that the company acquired its extensive holdings of land in South Africa primarily with the idea that in some of them at least valuable mineral occurrences would be proved to exist. As to that, we have spent, at one time or other, considerable sums in patient and systematic prospecting, and we have proved the existence of copper, tin, gold, diamonds, chrome iron, and coal; but we have not at any point been fortunate enough to meet with a deposit that seemed to admit, under present conditions, of profitable working. Industrial conditions in the Transvaal may change—sooner or later they must change appreciably—and then these deposits, of coal especially may prove to possess a commercial value that is not now apparent; but we have not felt ourselves warranted in any of these cases in embarking on a policy of costly exploitation in advance of these favourable developments. We have thrown open our land to free prospecting by all comers, but I am afraid the fact has at length to be faced that prospecting as we used to know it in South Africa, is rapidly becoming a lost art. Various reasons have been advanced for the disappearance of the old-time prospector, none of them entirely convincing; but, whatever the true explanation may be, the fact remains that he has not come along to take advantage of the most liberal terms that either the Government or we ourselves could devise for the prospecting of our properties, and that, I believe, has been the experience in recent years of landowners in general."

Swaziland Tin.

The secretary hands us particulars of this company's output for the month of June, 1914, as under:—Concentrates recovered, 33·768 long tons; estimated profit (taking the price of tin at £137 15s. per ton), £518; adjustments in respect of previous shipments due to fall in the price of tin, £762; balance to debit, £244.

Diamonds near Ventersdorp.

The "Potchefstroom Herald" announces that prospecting is said to be proceeding on the farm Stompies, near Ventersdorp, where several finds have already been made, one digger getting two stones—the largest a 1½ carat—in his first wash. A party of Eastleigh diggers, it is said, have been granted the prospecting rights, and no more ground is available. It is also said that interest in prospecting for diamonds is being evinced on adjoining farms, but much difficulty is being experienced owing to the shortage of water.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Mine Claim Areas.

To the Editor, *South African Mining Journal.*

Sir,—Whilst I have no desire to make invidious distinctions, I should like to point out that the exact claim holdings of the Van Ryn Deep, Ltd., is 764 and that of the Modder Deep, Ltd., 577 claims. My reason for raising the question is because I was informed, when in Maritzburg, that the Van Ryn Company only held some 200 odd claims, and Modder Deep 700 odd claims, which, in consequence, put me off purchasing Van Ryn Deep shares when they were lower. In some of the coast towns they seem to have very hazy knowledge of the statistics of our mines. At Ladysmith I came across a copy of your esteemed journal, when I was enlightened on the subject referred to.—I am, etc.,

READER.

Johannesburg, July 16th, 1914.

Economics of Citrus Growing.

To the Editor, *South African Mining Journal.*

Sir,—I have read your article and contributed letter on the subject of citrus growing. I am leaving home to-morrow morning and shall be away for about three weeks, so have not time now to go into this question. Your correspondent in the issue of the 4th inst. does point it all right, but I am afraid very few miners could clear anything like 35s. per tree—more likely 10s. Your correspondent seems to think you can take a miner and drop him on to a citrus orchard in full bearing and expect him to make a success of it. Do you think you could take a farmer and drop him down on a mine and he would make a miner straight off the reel? Yet you expect the miner to become a citrus grower without knowing anything about it. So simple and all as it may seem, still there is a lot of knowledge required before a man can grow citrus fruits properly, and make a success of it. Your miner would have to be taught first, and those who put their hearts into it would soon learn, others never. These big returns sound all right and put me in mind of an alluvial gold or diamond rush, where you hear only of the lucky man but nothing of the unlucky ones. Sorry I have not the time to write you more on this matter. When I get back I will send further information.—Yours, etc.,

HUGH I. HALL.

Riverside, Nelspruit,
July 20th, 1914.

[We suggest that Mr. Hall, whom we are quite prepared to accept as an authority on farming matters and whose practical knowledge commands respect, should read the speech of his old friend (and partner in the early Barberton days), Sir Percy Fitzpatrick, made in London and quoted elsewhere in this issue. Sir Percy stated that in South Africa a citrus orchard produces a profit of from £150 to £200 per acre. He, no doubt, based this calculation upon the prices paid in Europe for citrus, and not upon South African prices. We think our correspondent, "[illegible]," was wildly optimistic, whilst we look upon Mr. Hall as being unduly pessimistic. The figures quoted by us in our article were taken from Mr. E. A. Davis' report and some figures published by Mr. I. B. [illegible], both of whom are recognised experts. We cannot agree with Mr. Hall that there is such a large amount of knowledge required to carry on a citrus orchard when once it has been properly established. A farmer has always the Agricultural Department to fall back upon and can easily obtain the advice of the best experts in the country. It is hoped that Mr. Hall on his return will write us more fully and give some further reasons for being so [illegible] to our [illegible] correspondent.—Ed., S.A.M.J.]

Insurance Questions at Issue.

To the Editor, *South African Mining Journal.*

Sir,—I see by your last issue that you intend bringing out a special banking supplement. It struck me that you would be serving a very good purpose, and do a great service to many along the Reef, if you could see your way to bring out a special insurance number. One has to depend for facts and figures on insurance matters upon the bald statements of canvassers, who invariably crack their own companies up and run down those doing business in opposition to them. Apart from writing long-winded technical articles on insurance generally, may I suggest that you give information which will enable a man, who has no time to burrow into details, to select an insurance company that does not cancel one's policy merely because one is a month or so in arrear with the payment of a premium. I take it that most of the companies, whether South African, British or Foreign, are financially sound, and I presume that they all, more or less, incur the same amount of expenditure to secure new business and to retain the policy holders. Agents frequently endeavour to prove, to an intending insurer, that the working costs of all companies, except those they happen to represent, are enormously heavy, in consequence of which the bonuses are low, and that neither endowment policies nor life policies can pay out as much as they should do. This often puts a man off insuring. What one wants to get hold of is a safe investment for one's premiums, and liberality on the part of an insurance company in times of distress on the part of the insured. Many friends of mine are endeavouring to raise a "bit" on their policies, and it would seem that some companies are more liberal than others. Now, I want to know why? Does this liberality put up the working costs or does it necessarily mean that such companies are more economically run in securing new business, and can thus afford to be liberal with their policy-holders? I should also like to know whether a mutual company offers any greater advantages than a proprietary company. Is there any Insurance Act in this country which tends to protect policy-holders? Most of us admit that insurance is a good thing, and has been a blessing to many a home when the breadwinner has passed away, but we should like to have some simple facts and figures placed before us, and, if possible, some comparisions of working costs, surrender values and bonuses declared by different companies. Are the South African Companies necessarily weaker than, say, the big American companies, because they happen to have much smaller capitals?—I am, etc.,

R. E. S.

Germiston, July 21, 1914.

[Our correspondent's suggestion seems an excellent one, and we hope at an early date to publish a special insurance supplement dealing with the issues he raises.—Ed., "S.A.M.J."]

ANSWERS TO CORRESPONDENTS.

A number of answers to correspondents are unavoidably held over till our next issue.

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Rhodesian Section.

LATEST MINING NEWS.

Selukwe G.M. Co.—Pickstone Gold Mines—Globe and Phoenix—Union Miniere—The Warwick Patent Condenser.

The Selukwe G.M. Co. directors' report states:—During the year the tributer, Mr. Tyrrill, directed his attention to proving the ore deposit known as the Creek Reef, crushing ancient dumps and rubble, and exploratory work on the stringer formation, which has been called the Saddle Reef. This latter work has led to the location of two other similar formations, as to the value of which no definite conclusions have yet been arrived at. The negotiations for the leasing of the Southern Blocks to a tributer have also been carried through successfully. The tailings from Mr. Tyrrell's tribute are as yet untreated, but cyaniding will shortly commence on the accumulations which have been stocked. Further inquiries have been instituted by the Board as to the advisability of making some boring tests to locate and test ore-bearing lodes on the property. They are of opinion that in view of the renewed activity and exploration work in other directions, such work can usefully be postponed until further information of a reliable character as to the geological formation of the strata is obtainable. The expenses of running the Company in London and South Africa have again been much reduced, totalling £1,120 11s. 6d., as against £1,440 19s. 1d. last year. The amount received from royalties was £1,170 14s. 5d. as compared with £296 5s. for the previous year. The income from investments and interest totalled £2,121 17s. 10d., against £1,946 8s. for 1913. The surplus earned amounted to £2,184 0s. 9d., as against £651 13s. 11d. for the year ended 31st March, 1913.

* * * *

The manager's report on operations at the Pickstone Mine during the month of May states that 43 feet of development work was accomplished. The total gold recovery was 854 ozs., valued at £3,531. The expenses for the month, including development charges, amounted to £2,975, leaving a profit of £556. The capital expenditure during the month was £170, mainly in connection with the new main shaft.

* * * *

The figures of the ore reserves at the Globe and Phoenix Mine, as at 30th June last, were published on Monday. These read as follows: Tonnage 180,300, of an average stoping value of 28.5 dwts., containing 256,927 ozs. gold, valued at 84s.—equal to £1,079,093. These figures show an improvement, the corresponding totals at December 31st last being: tons, 180,757; 27.2 dwts.; 245,829 ozs.; value, £1,032,481.

* * * *

The balance sheet of the Union Miniere du Haut-Katanga shows gross profits of 4,000,000 francs, leaving, after deduction of working expenses, interest on debentures, and writing off, a net profit of 2,935,000 francs. A sum of 2,400,000 francs will be drawn for opening a provisional reserve fund, which is destined to write off some assets (works and mines). The remaining 535,000 francs will be carried forward.

* * * *

The construction of a third waterjacket furnace has been commenced at Lubumbashi, Katanga, which will be in operation in four or five months. The battery of 44 coke ovens is in working order.

* * * *

Scarcity of water is one of the misfortunes that is often the cause of much worry and expense to the small worker in Rhodesia, as the mines that have an abundant supply are, unfortunately, rather the exception than the rule, remarks the "Rhodesian Mining Review." It is no wonder that many inventions and suggestions have been made to save water which otherwise would go to waste, and perhaps the exhaust steam from a non-condensing engine has received most of this attention. Capt. J. Warwick had to turn his thoughts in this direction when faced by the scarcity of water at his mine in the Belingwe district and the outcome of his ideas was the invention of a condenser which has the great features of being cheap, easily installed, and simple, and further, it has been proved a success by practical application. The invention makes use of the pipe line that runs to the mill. This pipe line is jacketed for a length which depends on the size of the engine, the jacket being made with two-longitudinal joints so that it may be installed without breaking a joint in, or in any way altering the pipe line. The steam enters at the lower end of the jacket at a special cast iron "T" piece cast in halves. As the steam travels towards the upper end it condenses and the water gravitates down the jacket to the outlet whence it enters an oil separator from which it is passed to the boiler feed tank at a temperature of about 180 Fahr. Among the advantages of the Warwick Patent Condenser are that there is a condensation of 90 per cent.—95 per cent. giving a feed water free from dissolved matter, no upkeep cost or delays for cleaning, simplicity both in working and erection and a saving of about 10 per cent. in fuel.

Presiding at the annual meeting of the S.A. Copper Trust, held in London in mail week, Mr. T. Simpson remarked, *inter alia*:—

With regard to our properties, I will first of all deal with those in Northern Rhodesia. When we met you last year we had been advised by our engineers that the work carried out at King Edward and Argosy claims was sufficiently encouraging for further work to be proceeded with below the water level. This work was very much delayed owing to the difficulties met with, viz., the caving of the ground and water trouble. As the results obtained on the Argosy claims were not sufficiently encouraging, we decided to transfer all the plant to the western section of the King Edward Mine. The results obtained here are summarised in the report, and beyond repeating that at the 82ft. level we are working at points 1,800ft. distant, and that of this 570ft. gives 7.2 per cent. of copper over 39ins., 407ft. 8.5 per cent. over 12.8ins. and 65ft. 8.6 per cent. over 24 ins., and that there are further sections in which the reef has caved out, I do not propose to say more than that we are using every means possible to facilitate the completion of the work authorised—viz., sinking to the 200ft. level. At this point we shall cross-cut to the reef and put in a drive for, say, 200ft. Should this work show satisfactory results, and there is every reason to anticipate that it will, further development will at once be authorised. Our engineers are of the opinion that we should obtain better results below the water level than those which have been obtained at the first level, and that where the reef has caved on the first level, on the second level, we shall have reef matter of a higher grade. We are, of course, unable to form any definite opinion at this juncture, but we believe that in the King Edward Mine we shall have a mine which will yield a return upon the money spent in its development. We hope that this work will prove that the satisfactory results obtained on the first level may be looked for in depth. Should the mine come up to anticipation, we propose to float it as a separate company, and then devote our attention to our remaining properties. With regard to the Edmundian Mine, the board were not favourably inclined to the scheme recommended for the development of same, owing to the large sum required, as I stated when I met you last year. Our engineers have, therefore, after further consideration, recommended that we should offer the property for tribute upon the distinct understanding that the tributer should do certain development work. The board are pleased to report that during the year a greater interest has been taken in copper properties, with a result that we have been approached in connection with the Umkondo and Alaska Mines, in both of which there are very large quantities of ore developed, and we trust that both these mines may in the not far distant future be opened up with satisfactory results. I do not propose at the present moment to deal further with these two properties, seeing that they are the subject matter of negotiations which are taking place. With regard to Messina Copper Extensions, during the year an opportunity was offered us of obtaining an interest in a syndicate formed to explore and develop the farm Vryheid, which adjoins the farm on which is situated the Messina Copper Mine, which is well known to everybody. This offer was accepted, and the result of the work so far carried out would indicate that there is a possibility of at least one good mine being developed. It is, of course, too early yet to express any definite opinion, but in view of the great number of extensive "old workings" on the farm, and of the fact that the geological features are the same as those obtainable at the Messina Mine, your directors had no hesitation in accepting an interest in this venture.

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Engineering Notes and News.

The Progress of the Electric Furnace.

It has been generally supposed that British smelters and refiners have shown considerable reluctance to adopt the electric furnace, but statistics go to show that after all they have not lagged very much behind other countries. There are now 14 electric furnaces at work in England, 13 in France, 20 in Italy, 17 in the United States and 32 in Germany, besides a few in other countries, making a total for the world of something between 140 and 150. A remarkable fact is that in Germany 50 per cent. of the furnaces are of the induction type and 50 per cent. of the arc type. Out of the 20 Italian furnaces 19 are arc, as are 10 out of the total 13 French, and 13 out of the 14 English. The Heroult, the Girod, and the Stassano are the arc furnaces most numerously adopted, while the Kjellin and the Rochling-Rodenhauser occur most frequently in the induction installations. The progress in Scandinavia is shown by the fact that Norway and Sweden employed only nine furnaces for the smelting of pig-iron in 1912, and had more than doubled the number by the end of the following year, when 20 furnaces were in full operation.

Alcohol as Motor Fuel.

In a country which, like South Africa, possesses special qualifications for the production of alcohol, there is a practical interest attached to the announcement that the Imperial Motor Transport Council has appointed a committee to investigate the possibilities of the employment of alcohol as motor fuel. It is pointed out that if this object could be accomplished, on a sufficiently wide scale, it would render the Empire independent of foreign fuel supplies, which are a continually shrinking commodity, and would at the same time give a great impetus to agriculture, not alone in reference to the specific product under notice, but by reason of the general development which might be expected to follow the provision of improved means of transport. The subject is one which has been previously referred to in our columns. Statistics as to the consumption of motor fuel show an enormous and rapidly increasing demand. It has been authoritatively pointed out that in view of the ultimate arrival of a period when the stores of natural fuel, whether in the solid or liquid form, must be seriously depleted, the time may be considered to have already come when the consideration of the wider use of alcohol for power purposes must be taken into account. The process of alcohol manufacture is one which, from the nature of the product, must always be subject to restrictions, chief among which in this connection is the use of some denaturent capable of destroying palatability, while at the same time permitting of the effective use of the alcohol for the legitimate industrial purposes for which it would be designed. There remain the questions of cost of production, and the relative efficiency of a liquid fuel so produced. It can, of course, be produced from a wide variety of sources. Practically every variety of agricultural produce is capable of being so utilised. It is estimated that in America from cornstalks alone 100 million gallons of alcohol could be manufactured annually. In tropical and sub-tropical countries enormous quantities of material are available. Vast areas of starch-producing vegetation could be made to contribute. The use of alcohol for motors, specially constructed with a view to the application of this form of power, is, of course, already prevalent. The question is whether the system can be so far extended and made universal as to bring about that independence of foreign fuel supplies to which the cable refers. In France, and Germany, thanks to State-aid, the use of alcohol motors was for a time largely adopted, with commercial success.

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by Class, Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES.
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What is claimed to be the largest compressor so far adopted in connection with the coal-mining industry of Germany has been completed by the Frankfurter Maschinenbau Gesellschaft (Pokorny and Wittekind), of Frankford-am-Main, for the Werne Collieries of the Georgs Marienhutte Gesellschaft. The machine, which runs at a speed of 82 revolutions per minute, is capable of compressing 635.580 cubic feet of air per hour to a pressure of eight atmospheres.

The Ingersoll-Rand Co., are introducing a drill which is worked by Gasoline. It is called the "Temple-Ingersoll gasoline-air rock drill" and it employs the same kind of drill and pulsator as are used with the Temple-Ingersoll electric-air drill outfit, but in place of the electrical equipment a 6 horse-power single-cylinder gasoline engine is substituted. The machine should prove very useful for prospecting and other work where it is inadvisable to instal an air compressor.

New Patents.

249. Arthur Edward Dowling and Arthur Edward Reynolds.—Improvements in linings for the ends of tube mills.
250. Walter Bruce Brown and James Louis Stokes.—Improvements in or relating to railway sleepers.
251. Charles Hansen and Kinmear Reid Christie.—Improvements in water supplying attachments for rock drills.
252. Herbert Frood.—Improvements in and relating to brake blocks and the like.
253. George Wilbur Arnold.—Improvements in ore-concentrating machines.
254. Carl Travers.—Improvements in respirators.
255. James Wilshir and the Denver Rock Drill and Machinery Co.—Improvements in devices for passing water into rock drills.
256. Donald McLachlan.—Improvements in detachable bits for hand and machine rock drills.
257. Frederick Albert Wieland.—Device for controlling overspeeding of vehicles.
258. Thomas Patrick Stanton.—Improvements in mining and reducing ore.
259. Paul Selby.—Improvements in spraying apparatus.
260. Frank Hill. Improvements in rollers for mine shafts, haulage tracks and the like for supporting hoisting, hauling or other ropes or cables.
261. Elmore William Bender.—A cork inner tyre.
262. James Henry Ruthven.—Improved automatic emergency safety gripping brake for use on skip guide rails, ropes and the like, and on winding drums, wheels and the like.

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Finance, Commerce, and Industries.

Union Coal Rate. It may be recalled that during the discussion in Parliament on the Railway Budget, the question of unfairness of the existing rates upon coal for local consumption was raised by Mr. Henderson, and that the Minister for Railways had stated his intention to meet the Natal collieries and commercial interests shortly after the rising of Parliament. Mr. Burton has not delayed the fulfilment of his promise, but has, through the General Manager of Railways, notified the coal-owners and local bodies that he will be present at a meeting to be held in August for the purpose of discussing the position. The intimation is accompanied by a scale of the proposed reductions, and further states that the members of the Railway Board and the General Manager of Railways will also be present, and that no alteration of the existing charges will be effected until the proposed rates have been thoroughly discussed. It may be added that there is likely to be some difficulty in the unanimous adoption of the scale as proposed, for the reason that it is not intended to make any reduction upon coal brought from a distance of over [illegible] miles, and only collieries between the two distances will reap any benefit. Briefly, the proposed rate will reduce the carriage of coal to Durban from some collieries by one penny per ton, and from others by 12d. per ton. Some of the collieries whose coal comes to Durban will continue to pay the rate now charged. The proposed rate will apply equally to the Transvaal collieries, but will not affect them to the same extent, as most of the coal supplied from there finds a market either below or above the limits of distances named in the submitted scale. The results of the meeting is awaited with interest.

* * * *

Sir Percy Fitzpatrick on Citrus Crowing. Speaking at the Royal Colonial Institute in mail week, Sir Percy Fitzpatrick referred to the remarkable development that had taken place in consequence of irrigation, and said that in a small way the rivers of South Africa were doing for the Union what the Nile was doing for Egypt. As to the future, they had a first-class prospect in Rhodesia by reason of the world's ever-growing demand for meat, and in the Union by reason of the possibilities of the citrus industry. To show what this industry could do for South Africa he referred to what was being done in the United States. California sent outside its boundaries every year between 15 and 17½ million boxes of oranges, and Florida between 7 and 10 millions. If South Africa could get one quarter of that export trade it would have established a big industry. From £150 to £200 per acre per annum could be produced by fruit-growing. Could it be said there was no future for a country where such a result could be obtained? There was no country in the world that could match with South Africa. A greater white population was badly needed. They could not do all they ought to do in maintaining the glory of the British Empire with the aid of the native races alone. They must have white people to do the work. What was wanted in South Africa was the middle-class man, not the person who had got a lot of money. For the middle-class man there was not only the prospect of a livelihood, but of comparative affluence—something he never dreamt of. He was speaking of what he believed could be done. The best land in the world could be obtained in South Africa for £50 an acre and a liability for water, but to illustrate his argument he would double the price and make it £100. Well, oranges alone would produce from £150 to £200 per acre per annum. Look what was being done in the United States. There growers had to pay from £120 to £260 per acre for erections to keep off the frost. There was no frost in South Africa. Lord Grey, in thanking Sir Percy Fitzpatrick for his speech, said he would like to confirm from his own experience what had been said about the possibilities of fruit-farming. When he was in Western Australia a man had told him that he had obtained from 310 acres of grapes a profit of £12,000, and that was only £40 an acre. He was convinced that in the citrus industry of South Africa the country had something more valuable even than gold mines.

* * * *

Rhodesia and the Customs Union. At the last meeting of the Bulawayo Chamber of Commerce it was reported that the following decisions were arrived at by the Executive Committee in respect of questions asked by the Controller of Customs in his letter of May 21st (already published):—Question (a): Whether the advantages of the present arrangement whereby residents in this Territory can purchase from duty-paid stocks in the Union and can supply customers in the Protectorate are so great as to justify their continuance by our adopting the new Union tariff when it shall have been finally agreed upon? Answer: The Executive do not consider that the advantages of the present arrangements justify the adoption of the new Union tariff. Question (b): In the event of the answer to the above question being in the negative, what changes, if any, would you recommend in the present tariff upon goods from oversea? Answer: The Executive recommend that the present tariff be reduced on many lines of necessaries of life from the United Kingdom and British possessions, and that in certain instances the tariff should be increased on imports from foreign countries. Question (c): Whether you are in favour of free interchange of South African animals and raw produce? Answer: The Executive are in favour of free interchange of South African animals and raw products. Question (d): Whether you are in favour of a duty being levied in future upon Union manufacturers generally, and if so, at what percentage less than the rates charged upon similar goods from the United Kingdom? Answer: Yes. The Executive are in favour of 25 per cent. preference being granted on manufactured goods from the Union of South Africa as against the United Kingdom and British possessions which reciprocate. Question (e): In the event of your answer to (d) being in the affirmative, please supply a list of articles upon which you recommend the duty should be suspended either wholly or in part, in order to reduce the cost of living. Luxuries and articles in respect of which some reduction in retail price would not generally be made should be omitted. Answer: The Executive are not in favour of a Suspended List, but would prefer that the whole tariff be remodelled. It is a recommendation, added the Executive, that Rhodes' Clause be maintained intact.

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The Week's Company Meetings.

NEW KLEINFONTEIN CO.

Special General Meeting.

Capital Increased.

At a special general meeting of the New Kleinfontein Co. on July 21st it was decided to increase the capital of the company from £1,151,540 to £1,300,000 by the creation of 148,460 new shares of a nominal value of £1 each. The increased capital is to be used to develop the property brought to the New Kleinfontein under the basis of amalgamation with the Apex gold section and the Benoni Company. Colonel Dalrymple presided and among those present were Messrs. C. P. Marais, W. J. Gau, H. W. Anderson, J. H. Ryan, S. A. Mortimer, J. J. Hardwicke, A. G. Gill, W. H. B. Frank, A. J. Yates, E. J. Way, consulting engineer, L. S. Raymond (secretary), and G. W. Austin (transfer secretary).

Chairman's Speech.

The Chairman, in moving the special resolutions, said: This meeting has been called for the purpose of considering and, if thought advisable, adopting certain proposals for an increase in the share capital of the company, to provide funds to meet expenditure that will be necessary to commence the exploitation of the properties recently acquired from the Apex Mines, Limited, and the Benoni Consolidated Gold Mines, Limited. The notice of this meeting sent to shareholders on the 19th of June, 1914, and the circular which accompanied it set out fully the proposals referred to, and it seems unnecessary now for me to recapitulate what was there stated. I will, however, deal more particularly with a few points, which have been provoked by shareholders, concerning the resolutions which you will be asked to sanction to-day. At the meeting of shareholders held on the 20th of March, when it was decided to purchase the property of the Benoni Consolidated Gold Mines, Limited, and the gold section of the Apex Mines, Limited, you were informed, in the event of the amalgamation being carried through, and provided the necesary funds were forthcoming, that a certain programme of work would have first consideration. This programme is referred to by the consulting engineer in his report of the 17th of December, 1913, as the "second stage." The crushing capacity of the company will be increased to 75,000 tons per month, by, firstly the carrying out of alerations and additions to the Benoni sands and slimes plant, and bringing its capacity up to 25,000 tons per month; secondly, the dewatering of the Benoni Mine, and the effecting of such underground work as will enable your company, in the first instance, to supply the Benoni section of the equipment with ore from the Benoni Mine. The working capital now to be raised will be used for these purposes alone, with the addition of making the necessary underground connections between the works of the Apex main shaft and those of the Benoni west shaft, in order to provide the second outlet from the Apex workings required by the Mining Regulations. The distance between the two shafts is approximately 1,500 feet.

Reason for Gratification.

I think, viewing the financial uneasiness which prevails both here and in Europe, we have reason to feel gratified that within so short a time after the amalgamation has been effected, we have been able to secure a guarantee for the provision of the working capital necessary for the purposes afore-mentioned. It is possibly true that, had we been content to wait some indefinite period, better terms might have been arranged. But we must bear in mind that, in the best interests of the shareholders, it is all important to get the crushing unit increased with as little delay as possible, in order that the company may have the benefit of the profits resulting therefrom, within the shortest period. I may state that, in anticipation of your agreeing to provide additional working capital, the preparation of plans and estimates, and also the preliminary work in connection with the remodelling of the Benoni plant, has been undertaken, so that there shall be no delay when the necessary funds are forthcoming, in getting straight ahead with the work. The statement published with the notice of declaration of the interim dividend for the period ended the 30th of June, 1914, showed that it was estimated that there would be a cash deficit of £77,000 at that date, after providing for the current liabilities of the Benoni, amounting to £45,600, as compared with £73,000 at the 31st of December. 1913.

Shareholders' Question.

Shareholders have asked why sufficient capital is not being raised to meet this deficit, in addition to providing for the extensions of plant, etc., above referred to. I may state that, quite apart from the difficulty of raising large sums of money, your directors consider that the interests of shareholders will best be served by continuing to apply a portion of current profits towards the liquidation of this deficit, rather than by still further increasing the capital account, when share values appear to be unduly low, and it is a burden the profits may reasonably bear. Shareholders have asked me to make a statement as to the life of the enlarged property. It is with great reserve that I do this, for only 4 per cent. of the claims recently acquired from the Apex company has been proved, and, till the area has been further developed, any statement on the life of the mine must be based on the expectation of payable ore contents. It is only possible to make an accurate estimate of the life of a mine when a mine approached within measurable distance of the termination of its life. Our present rate of crushing is approximately 50,000 tons per month. We are anticipating within a year increasing this rate of production to 75,000 tons per month, with an ultimate expectation, probably within a few years, of attaining to 100,000 tons per month. But it is quite impossible for me to say on this occasion exactly when this last position will be reached. I have gone into the matter very carefully with our technical advisers, and I think it will be reasonable to state, taking all the various factors into consideration, that you may expect a productive life of from twenty to twenty-five years; but I make this estimate, as I have already stated, with the greatest possible reserve.

Guarantors' Liability.

As attention has been called to it, I will also say a few words about the clause in the agreement whereunder the guarantors' liability ceases, in the event of the making-up price of Rand Mines, Limited, shares on the London Stock Exchange at the end of July account being below £5 5s. This is practically another way of expressing what is known as the "war clause," which has appeared from time to time in other similar agreements. For instance, when the Crown Mines debenture issue was underwritten in 1912, when the outlook was uncertain, provision was made that, if certain countries went to war, or Consols fell below a fixed price, the guarantors would withdraw. In this instance, in view of the unsettled conditions existing when the negotiations were proceeding, and which, as a matter of fact, still exist, so as to provide against a sudden political collapse which would effect all securities, the guarantors demanded similar protection; and, instead of the price of Consols being taken as the test, Rand Mines were selected as being a representative South African mining share, and, as the directors considered it of the utmost importance that the work referred to should be proceeded with, they did not consider that this should be a breaking point in the negotiations, and we thought it, in the circumstances, a fair risk for the company to take.

Further Criticism.

We have also been subjected to slight criticisms in connection with the payment of the underwriting commission of 5 per cent., and it has further been suggested that the new issue should have been first offered to the shareholders for guarantee, apart from the rights under the issue. Gentlemen, with regard to the latter, it is needless to remind anybody who knows anything about such matters that this is quite impracticable. The position briefly is this, that the board of directors required a minimum sum of money to carry out certain works, which have been detailed to you, and the whole issue has been offered to shareholders pro rata to their holdings; but, in order to justify the expense entailed in putting forward such a scheme, and knowing from experience that shareholders, to an undeterminable extent, do not exercise such rights, it was absolutely necessary for the board to obtain a guarantee so as to ensure the complete issue being subscribed, and thus avoid the possibility of the management being unable to fully carry out the policy which has been forecasted. You are all aware that underwriters of issues in both gilt-edged and speculative securities have, of recent years, almost without exception, been required to take up over 50 per cent. of the amount underwritten, and it is extremely difficult at the present time to get guarantees for underwriting at all. Personally, I think the company has done well in getting the issue underwritten at as small an expense. Neither corporations nor individuals can be expected to undertake financial obligations extending over a period of three or four months, without some consideration, and the equivalent of one shilling per share cannot be considered an excessive charge to make for a guarantee on a mining share of the approximate market value of 20s. The shares, as you know, will be issued at par, which we consider a low figure, and should be an inducement for shareholders to exercise their rights, as each individual shareholder who holds complete units of ten has the opportunity of taking his pro rata. Consequently, no exception can be taken to the policy of the board in this matter.

I now beg to move: (1) That the nominal capital of the company be increased from £1,151,540 to £1,300,000 by the creation of 148,460 new shares of a nominal value of £1 sterling each, 115,154 of which shares shall be offered to shareholders for subscription pro rata to their registered holdings in the company as at the 30th of June, 1914, in the ratio of one new share for every ten held, at the price of 20s. in cash per share. Any balances not taken up and paid for by the shareholders above-mentioned shall be issued to the guarantors of the issue or their nominees at the price of 20s. per share. All shares representing fractional interests shall be allotted to and taken up by the guarantors or their nominees at the price of 20s. per share.

(2) That the directors be authorised to fix all other terms and conditions on which the said issue is to be made, and to provide that any shareholder as above-mentioned, failing to comply with such conditions, shall not be entitled to participate in the subscription, and for the closing of the share registers and depositing of bearer shares, and generally to settle and carry out all the details of the scheme, to confirm the payment of a commission to the guarantors of 1s. per share on the whole amount of capital now offered for subscription, which commission will be paid to them in shares in the company, taken at par, and issued to the guarantors or their nominees as fully paid up.

(3) That the directors be authorised to take all steps necessary to register and record the said increase of capital, and to issue the shares in accordance with the resolutions taken at this meeting.

The resolutions were carried unanimously. There were no proxies against the scheme, 832, representing 298,253 shares, being recorded in its favour.

THE WEEK IN THE SHAREMARKET.

Easier on European Situation and Home Political Crisis—Setback Only Temporary.

It is no fault of the Rand that the market in gold shares should have eased off during the week. The political crisis in London and the disquieting news from the Continent are alone to blame for the setback. Given an improvement in both these directions and Rand stocks will doubtless soon resume their interrupted upward course. The July gold output promises to be an excellent one, and conditions in the industry were never better. Modder Deeps have fluctuated considerably in the past few days, and though the prospects improve with every foot of development done, the shares have receded with the general market. The property has certainly given a fillip to the whole of the Far East Rand, and the shares are talked up very much higher. A firm undertone has characterised the market for Rand shares generally, and dividend payers are being quietly picked up. There has been increased enquiry for small stocks with a view, doubtless, to a general appreciation in prices. Of tin and diamonds there is little to say, beyond mentioning the Homeric laughter that shook the House when a number of anonymous wires were received tipping certain much depressed diamond shares. The market promptly responded by marking the shares in question down a further shilling.

* * * *

	Fri. 17th	Sat 18th	Mon. 20th	Tues 21st.	Wed. 22nd	Thur 23rd
[illegible]	0 5*	0 5*	—	0 3*	0 3*	0 3*
African Farms	11 6*	11 0*	11 6*	11 6*	11 5	11 0*
Apex Mines	17 6*	17 9	17 0*	16 6*	16 6*	16 6*
Aurora Wests	3 9*	—	—	—	—	3 9*
Bantjes Cons.	13 6*	13 9*	—	—	14 0†	13 3*
Brakpan Mines	—	62 6*	62 6*	—	—	53 0†
Breyten Collieries	[illegible]	[illegible]	—	24 6*	21 6*	25 0*
Bushveld Tins	0 4*	0 6†	—	0 5*	0 5*	0 5
City and Suburban	[illegible]	[illegible]	[illegible]	43 0*	[illegible]	[illegible]
City Deeps	—	65 0†	65 0†	62 0*	63 0	64 0†
Cloverfield Mines	4 4*	4 9	4 9	4 0*	4 6*	4 7*
Clydesdale	9 9*	10 0*	10 6*	10 0*	10 6*	10 3*
Cons. Langlaagte	[illegible]	31 6*	—	31 0*	31 6*	31 6*
Cons. Main Reefs	18 0*	[illegible]	18 0*	18 0*	17 9*	17 0*
Cons. Mines Selection	[illegible]	[illegible]	10 0†	10 0	10 0†	10 0
Coronation Colls.	21 0†	—	—	17 6*	21 0†	—
[illegible]	0 3*	0 3*	0 3*	0 3	0 3*	0 3*
[illegible]	—	3 6*	3 6*	—	—	—
[illegible] Diamonds	—	—	2 0*	2 0*	2 6*	2 6*
Durban Roodepoorts	—	18 3*	17 6*	18 0*	—	18 0*
Durban Roodepoort Deeps	—	—	17 6*	17 0*	17 9*	—
E.R. Centrals	2 0*	[illegible]	2 3	2 4	2 0*	2 2*
E.R. [illegible]	1 7*	1 7*	1 7*	1 7*	1 7*	1 7
E.R. [illegible]	1 8*	1 7*	1 7*	1 9	1 [illegible]	1 8*
E.R. Minings	—	[illegible]	[illegible]	—	—	—
E.R.P. [illegible]	[illegible]	[illegible]	[illegible]	36 3	34 0*	34 9*
[illegible]	1 3*	1 2*	1 0*	1 3*	1 1*	1 0*
Frank Smiths	4 0*	3 6*	3 6	—	2 6*	2 6*
Geduld Props.	[illegible]	[illegible]	[illegible] 9*	[illegible] 0*	[illegible]	[illegible]
General Mining	[illegible]	—	—	—	—	—
Glencoe Collieries	[illegible]	—	6 3*	—	6 3*	—

*Buyers. †Sellers.

	Fri. 17th.	Sat. 18th.	Mon. 20th.	Tues. 21st.	Wed. 22nd.	Thur. 23rd.
Glynn's Lydenburgs .	—	10 0*	10 0*	11 0*	11 0*	11 0*
Govt. Areas	24 9	24 9*	25 3*	24 9	24 3	24 3
Joh. Bd. of Ex.	24 0†	24 0†	24 0†	24 0†	24 0†	24 0†
Jumpers	—	—	—	4 0†	—	—
Jupiters	5 0	5 0	5 0	4 9*	4 6*	4 6*
Kaalfonteins	0 3*	—	0 3*	0 3*	0 3*	0 3*
Kleinfontein Est. . .	20 0†	20 0†	—	20 0†	20 0†	20 0†
Klerksdorp Props. . .	2 3*	2 3*	2 3*	2 3*	2 3*	2 3*
Knight Centrals . . .	7 2*	7 3	7 1*	7 0*	6 10*	7 1*
Knights Deeps	—	34 0†	—	—	33 6†	—
Lace Props.	3 6	3 5*	3 7	—	3 6*	3 6*
Langlaagte Estates .	—	—		19 9*	19 6*	19 9*
Luipaardsvlei Est. .	11 0*	11 0*	11 3	11 0*	—	11 0
Lydenburg Farms . .	3 1*	—	3 0*	3 0*	3 0	3 1*
Main Reef Wests . . .	8 0*	8 6	8 6	8 6*	8 3	—
Meyer & Charltons .	113 0*	113 0*	113 0*		—	—
Middelvlei Estates. .	1 6*	1 6	1 6	1 6	1 6*	1 4*
Modder B.'s	87 0†	85 0*		—	—	—
Modder Deeps	65 0	65 0	61 9	63 6	61 9	61 3
National Banks	—		250 0*	253 9†	253 9†	253 9†
New Boksburgs . . .	—	—		—	0 9*	0 11*
New Elands	22 0	—	—	—	—	—
New Era Cons. . . .	6 3†	5 11*	—	6 3†	5 6*	5 6*
New Geduld Deeps .	2 2*	2 1*	2 1*	2 2	2 1	—
New Goch	—	16 6*	16 0*	15 0*	—	15 0*
New Heriots	65 0*	66 6*	66 6	65 0*	—	—
New Kleinfonteins .	24 9*	24 6	24 6	24 3	23 9	23 0*
New Modders	—	—	—	—	—	26 0†
New Primrose		—	—	—	—	17 6†
New Rietfonteins . .	3 9*	4 0	4 0*	3 9*	3 0*	3 0*
New Unifieds	16 0*	16 6	16 0*	16 6*	—	17 6*
Orange Diamonds . .	1 1*	1 1*	1 1*	1 3	1 4*	1 5*
Pigg's Peak	9 9*	9 9*	9 9*	—	—	—
Pretoria Cements . . .	—	—	41 6*	41 6*	42 6*	43 0*
Princess Estates . . .	5 6*	5 6*	5 3*	5 6*	5 6*	5 6*
Rand Klips	3 2	3 2	3 3	3 3	3 1*	3 1*
Rand Nucleus	1 9*	1 9*	1 9*	1 10*	1 9*	1 8*
Randfontein Deeps .	3 9*	—	3 9*	3 9*	3 7*	3 9
Randfontein Estates .	—	21 0*	—	—	20 0*	20 0*
Roodebergs	22 6*	22 6*	23 0	22 9	22 6*	23 3
Roodepoort Uniteds .	8 0†	—	8 0†	—	8 0†	8 0†
Ryan Nigels	—	3 2*	—	3 2*	—	3 2*
Shebas	—	4 0†	—	—	4 6†	—
Sumner Deeps	—	1 10*	1 9*	1 9*	1 8*	1 9*
S.A. Lands	3 0	3 0*	3 0	3 0	2 11*	2 11*
Springs Mines	14 3*	14 6	14 6*	14 6†	14 3	14 0
Sub Nigels	10 9†	10 0*	10 0*	10 6*	10 3*	10 6
Swaziland Tins	27 6†	24 0†	24 0†	—	—	—
Trans. Coal Trusts .	31 3*	—	—	—	—	—
Trans. G.M. Estates	—	—	40 0*	41 0*	39 0*	40 0*
Tudor	2 0†	—	1 0*	—	—	1 0*
Van Ryn Deeps . . .	46 3	46 9	46* 6*	46 3*	45 6	45 0*
Village Deeps	—	—	38 9	—	—	—
Village Main Reefs .	32 0*	32 0*	—	32 0*	32 0*	32 0*
Vogel Con. Deeps .	—	—	0 6*	—	—	—
West Rand Cons. . .	—	7 3*	—	—	6 3*	—
Witbank Collieries . .	43 3*	43 0*	43 0*	43 0*	43 0*	43 0*
Witwatersrands . . .	—	66 0	—	—	62 6*	63 6*
Wit. Deeps	45 6	45 6	45 3*	45 0*	45 0*	45 0*
Wolhuters	15 0*	15 0	15 0	15 6†	14 6*	14 6*
Zaaiplaat Tins . . .	25 6*	25 6*	25 9*	25 6*	25 0*	24 6*

*Buyers. †Sellers.

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CONTENTS.

PAGE

Notes and News ... 573

Topics of the Week:
- The Outlook ... 575
- Some Lessons of the Crisis ... 576

How the War May Affect the Rand Industry ... 577
Knight Central ... 578
The Madagascar Oil Field ... 579
Modder B. New Equipment Completed ... 580
Mining as a Profession ... 581
The Manager and Staff of the Bantjes Consolidated Mines, Ltd. ... 581
Output and Profits ... 582
The Economic Use of Workmen on the Rand—II. ... 583

Rhodesian Section:
- Latest Mining News ... 584
- Rhodesia's Mineral Output ... 585

The Week in the Sharemarket ... 587
Engineering Notes and News ... 589
- Selection, Installation and Operation of Transformers ... 589

Finance, Commerce and Industries ... 592

Notes and News.

Robinson Deep.

We are advised that, owing to movement of ground surrounding vertical shaft No. 2, at the Robinson Deep, work must be suspended in this shaft for the purpose of investigating its condition and making safe, in consequence of which the August output will be considerably reduced.

* * * *

Food Supply in War Time.

In the House of Commons in mail week, Mr. Hunt (U., Ludlow) asked the Prime Minister whether he could say how many weeks' supply of wheat and wheat flour could be depended on to be in the country during the months of May, June and July in the case of sudden war; and whether the Admiralty could guarantee that sufficient wheat and wheat flour could be imported to prevent bread from rising to a price at which the poor would be unable to buy it. Mr. Asquith said that the question of the food supply of the country in time of emergency was under the continuous observation of the Government, and it would not be in the public interest that the information asked for in the first part of the question should be given. Mr. Hunt: "Are we to understand from the answer given by the right hon. gentleman that he can give no assurance that the country will be safe from starvation in time of war?" Mr. Asquith: "No, sir. The matter is under the continuous observation of the Government, and everything humanly possible is being done."

* * * *

Netherlands Bank of South Africa.

The report for the year 1913 of the Netherlands Bank of South Africa reached us by this mail, just too late for inclusion in our Banking Supplement. It was submitted to the meeting on 25th June last, covers the year 1913, and states that during this period the position of affairs generally in South Africa was not satisfactory. Nevertheless, the figures of the profit and loss account, as compared with those of the two preceding years, do not show much difference. The directors have continued the policy of restricting their interests in Johannesburg and developing their connections with the farming population at the smaller branches. Therefore, to a still greater extent the latter have contributed to the profits of this year. After fully providing for bad and doubtful debts and setting aside a substantial amount for depreciation of bank premises and furniture, the net profits for the year including the balance of £612 (7,348 fl.) brought forward from last year amount to £13,785 (165,421 fl.), which the directors recommend should be applied as follows: Dividend of 4 per cent. on subscribed capital; transfer to reserve fund (making it £28,400), £1,400; transfer to internal reserve for doubtful debts, £2,500; leaving to be carried forward, £285.

* * * *

National Diamonds.

At a special general meeting of National Diamonds held this week, after an explanation of the position of the company by the Chairman, and a statement on the reasons why fresh capital was necessary, some criticism was forthcoming, but the meeting unanimously adopted a resolution from the chair. The feeling of the meeting appeared to be that the course proposed by the directors was the only one possible. The following policy was decided on: (1) Reduction of capital from 340,000 shares of 10s., to 340,000 shares of 1s. each; (2) an increase of the new capital of the company amounting to £17,000 to £50,000, by the creation of 1,000,000 shares of 1s. each. Of these one million shares, 340,000 will be distributed among shareholders in proportion of one share for every one share now held by them; 400,000 shares will be allotted to the guarantors or subscribers for working capital, 100,000 shares to guarantors for guaranteeing working capital, and 160,000 shares will be held in reserve.

Nissen Stamps on the Rand.

The starting up of the new equipment of the Modder B. mine is an event of considerable importance inasmuch as the battery of 16 Nissen stamps is the first installation of this type of any size to be operated on the Witwatersrand. It is true that in the City Deep mill there have for some time past been four Nissen stamps, but this after all is a very small equipment, and the 16 Nissens at the Modder B. may be regarded as the first battery of consequence to commence work on the auriferous conglomerates of the Main Reef series. By far and away the largest Nissen stamp equipment in this country is that of the Shamva Mines in Mashonaland. This company is equipped with 25 stamps of this pattern. Much interest is being evinced in the new Modder B. plant, and it is not unlikely that the second mill of the New Modderfontein Company, which is to be erected in the vicinity of the new circular shaft in the near future, will also be of Nissen pattern.

* * * *

Model Mine at the Panama-Pacific Exposition.

The United States Bureau of Mines has undertaken to construct, in co-operation with the mining industry and the manufacturers of mining machinery, a mine beneath the floor of the Palace of Mines and Metallurgy at the Panama-Pacific Exposition, San Francisco, next year. Typical metal and coal-mining operations will be reproduced by full-size working places, in which mining machinery will be installed and operated. Twice each day there will be an imaginary explosion or fire in some portion of the mine, and rescue men wearing breathing apparatus will enter the mine and bring out supposed victims, who will be given first-aid treatment in the surface emergency hospital.

* * * *

Kynochs and the Rand.

Commenting on the reduction in profit derived from the South African business on account of labour troubles, Mr. A. Chamberlain at the annual meeting of Kynochs said that: "The march of time and the fluctuations of the market has shown that in their desire to improve their own condition they counted too much on chance, and gave too much away to their customers on the Rand. The result had been the latter had benefited largely by the company's advent. Their contracts were now due for renewal, and experience led him to believe that the terms would be more mutually favourable than those in the contracts now about to expire. In the meantime their only hope of making a reasonable profit lay in the maintenance of a large and regular output. Unfortunately, last year, owing to the strikes in South Africa, their output was neither large nor regular, and consequently their profit was small and unsatisfactory. It was, perhaps, some consolation to know that it was at least a profit and not the loss it might have been. The prospects in South Africa for next year's business were, he believed, improving, and they were counting on a better result than that obtained during the last year."

* * * *

International Gold Reserves.

In view of the present monetary crisis in Europe, it is noteworthy that at the recent Congress of Chambers of Commerce in Paris, one of the leading questions brought up was the question of gold reserves as a means of preventing panics, on which a committee had been appointed the year before. The report of this committee was presented by Mr. Faithfull-Begg, of London, suggesting an international organisation by which the circulation of gold supplies can be regulated quickly and effectively and the reserves placed where they are especially needed in times of trouble. The idea is that this clearing house should control a large reserve of gold held in readiness for quick and effective use. The report suggested that the reserve should amount to £18,000,000, to be contributed by the six leading commercial nations, and to be held permanently at six financial centres, except when specially needed. The clearing-house part of the committee's scheme met with few objections, but the reserve section was sharply criticised by such eminent financial authorities as M. Raffalovitch and Herr Kaempff. They both pointed out that the questions involved would stir up matters of an international and political character, and that it might be very difficult to secure agreement as to the use of the reserve, or the special need for it at any one centre. Moreover, Herr Kaempff suggested that the hoarding of so great a sum might in itself at times cause financial trouble. Another point, which does not seem to have been brought up at the meeting, was that some of the great commercial nations might very strongly object to the use of the reserve to meet an emergency caused by an outbreak of militarism and excessive expenditure for armaments on the part of other nations. Such a condition has been the cause of the demand for gold which has been so strong in Europe for the past half year. The Congress referred the whole matter back to the committee for further study and a report two years hence, by which time, it would seem, we shall have some practical experience to guide us.

* * * *

Tweefontein Colliery.

The issue in London of 75,000 six per cent. cumulative preference and participating shares of £1 each at par, and 14,153 ordinary shares of £1 each at £1 10s. per share by the Tweefontein Colliery, Ltd., is announced. The share capital of the company consists of 75,000 six per cent. cumulative preference and participating shares of £1 each and 125,000 ordinary shares of £1 each, of which 45,847 ordinary shares have already been issued and are fully paid. The preference shares will, after a non-cumulative dividend at the rate of 6 per cent. per annum has been paid in any year on the ordinary shares, be entitled to receive out of the profits remaining available an extra non-cumulative dividend at the rate of 4 per cent. per annum before any further dividend is paid to the holders of the ordinary shares. Debenture stock to the nominal amount of £90,000 (part of an authorised issue of £100,000) has been issued and is now outstanding, and the proceeds of this issue will in the first place be applied to redeem the whole of this at par. In order to ensure this the debenture stockholders will subscribe on the terms of the prospectus for any part not taken by the public, no part of the issue having been underwritten. The prospectus states that under an arrangement to which the company and nearly all other important collieries in the Transvaal are parties, the sales of the Tweefontein Colliery, Ltd., and other collieries are pooled for five years from 1st July, 1913, with certain exceptions in favour of this company and other collieries. Subject to these, the Tweefontein Colliery, Ltd., is allotted a proportion of the total coal sold by the combined collieries, which since the beginning of the arrangement has averaged 25,997·27 tons per month. In addition thereto the company has acquired as from 1st July, 1914, the share capital of the Premier Coal, Ltd. (Transvaal), and through this the Tweefontein Colliery, Ltd., will obtain the benefit of the Premier Company's allotment in the trade of the combined collieries, which is on the basis of 10,500 tons per month for four years from 1st July. The subscription list will open on Monday and close on or before Thursday.

* * * *

Congo Minerals.

The British Consular report of the trade of Katanga during 1913 observes that in 1913, considering the proved richness of the country in minerals and the fact that many of the areas will soon be entering upon the period of exploitation, and that the present commercial situation may be considered sound, there is no doubt but that the territory is entering upon a period of prosperity that should be of many years' duration. British merchants are advised to make as prompt efforts as possible to establish themselves firmly in a market which, from general indications, should be a valuable one to them. The Consul adds that the Union Minière du Haut Katanga, a Belgian company, of which 39·5 per cent of the shares are British-owned, and which works the large copper belt of Katanga under a concession, has made various additions to the smelting plant at Elisabethville. Coke ovens of the latest pattern have been constructed capable of producing 3,000 tons of coke monthly from a low-grade coal, and it is proposed ultimately to make use of the gas for heating boilers. A briquetting plant of six machines with a capacity of 200 tons daily has been erected for the treatment of fine ores and flue dust, while a third water-jacket furnace is being built, and the construction of several more is under consideration. The output for 1913 was 7,400 tons of bar copper from 60,000 tons of ore, the ore assaying from 12 to 18 per cent. pure copper. The copper bars assayed 96 per cent. pure copper and were landed at Antwerp at a total production cost of from £36 to £40 per ton. Ironstone is found in quantity on the railway line between Elisabethville and the southern border, and is easily extracted.

* * * *

The Wanderer Report.

The report of the Wanderer (Selukwe) Gold Mines, Ltd., submitted to the meeting on the 15th ult., covers the year ended 30th April, 1914, and states that the tonnage treated was 150,062, as compared with 222,445 during the previous year, the decrease being due to the shutting down of the Camperdown section, reference to which was made in last year's report. The average assay value of the ore treated was 2·82 dwts. per ton, showing an increase of ·331 dwts. over the average grade for the year to 30th April, 1913. Notwithstanding the reduced tonnage, the working costs are again the lowest attained on the mine, being only 6s. 3·16d. per ton, as against 6s. 5·40d. during the previous year, and over 7s. 6d. for the twelve months ended 30th April, 1912. The development work for the year totalled 6,845 feet, at a cost of £5,041, or 14s. 8·77d. per foot, as compared with 14s. 9·76d. per foot last year, but, for reasons given in the manager's report, it is not anticipated that the exceptionally low costs can be maintained. The ore reserves at 30th April, 1914, were estimated to be 102,300 tons, or an increase of 34,369 tons, as compared with the estimated tonnage at 30th April, 1913; the ore developed during the year reached 188,459 tons. It would appear that the payable ore on the Kemerton and Ashton sections of the property has now been practically exhausted, and, in view of the Camperdown being let on tribute, the Wanderer remains at present the only section from which further profitable ore is expected. The board, therefore, recommend, in view of the mines being gradually worked out, the reduction of the capital of the company to £90,000, divided into 600,000 shares of 3s. each, and making a return of capital, subject to the approval of the Court, of 2s. per share. At 30th April, 1914, a sum of £57,036 was available for this purpose.

* * * *

Willoughby's Consolidated.

The annual report of Willoughby's Consolidated Company, Ltd., has been issued for the year 1913. The total income for the year amounted to £80,797, and after deducting all expenses, the profit and loss account shows a credit balance of £15,726, which, added to the amount brought forward from 1912, less income tax, gives a total credit balance of £17,335. The mining properties at December 31 last included 2,637 gold claims and two base metal locations. During the year 18 claims were acquired, 15 were sold, and 220 abandoned. Of the above claims, 2,218 have been commuted by payment, and are held free of any interest or royalty due to the British South Africa Company; 2,161 of these being also free from compulsory work. On the Eileen Alannah, the existing plant, comprising 10 stamps, recommenced crushing in December last, pending the erection of the new plant which is now proceeding. A considerable increase in the output may be anticipated about November next, when part of the new plant should commence operating. On the Matabele Queen's work has proceeded steadily throughout the year. The mine is now earning an increased monthly profit, while encouraging reports on the improvement in value below the 8th level have recently been received. At Connemara the provision of the necessary funds for the erection of a plant with a capacity of 5,000 tons per month is now under consideration.

TOPICS OF THE WEEK.

THE OUTLOOK.

It seems impossible, at the time of writing, that Europe can escape a general conflagration, with all its attendant financial, commercial and industrial dislocation. Some satisfaction, however, may be found in the fact that the greater the upheaval and the more widespread the effects, the speedier will a decisive result be reached and the sooner will the struggle tend to exhaust itself. No student of foreign politics can pretend to be surprised at the developments of the past ten days; nor can one be surprised if those developments bring in their train all the horrors of a great European conflict between Slav and Teuton, with the Latin and Anglo-Saxon peoples inevitably involved. It is easy, of course, to be wise after the event, but it does seem short-sighted of European publicists not to have foreseen some months ago the coming storm. In the feverish and insatiable demand for gold from nearly all the Continental centres that has been so marked a feature of international finance in the past six months, it ought to have been possible to detect a whisper of the imminence of the inevitable. In the international sharemarket no less than in the money market signs have not been wanting that something only vaguely apprehended was afoot. All markets have of late suffered to a more than usual extent from attacks of " nerves "—and now, of course, we know the reason. The United States, for instance, will be much disgusted to find that her enormous gold shipments, the destination of which seems to have exercised her considerably, merely went to swell the war-chests of Europe. Moreover, practically the whole of the gold supplies from this country have gone the same way, and the Bank of England appears in mail week to have been only beginning to wake up to the fact that something more than normal influences were at work to attract the metal to the other side of the Channel and beyond. France, in mail week, was able to give tangible proof of the fertility of her resources by subscribing forty times over the new issue of £35,000,000. Whatever happens it is patent that the balance of financial advantages will rest with the Triple Entente rather than with the Triple Alliance. In this respect all the Balkan States remain in a singularly bad way, and France, though hitherto refusing to help them, may now, for obvious reasons, feel constrained to do so. Russia, which is known to be on the eve of making another large issue for Army and Navy purposes, will doubtless have to content herself with temporary French credits, the difference in the loan, after all, being not a matter of amount but of form. Other noteworthy features of the situation are the early refusal of all the German banks, except the Reichsbank, to pay out in gold, and the splendid front presented by the Bank of England in the face of such an unprecedented crisis. The action of the last-named has already gone far to stop the rot in the sharemarket, and should react most favourably on every phase of business activity. The drop in Consols, though, of course, deplorable, cannot be expected to last longer than the early days of the crisis. Coming nearer home, of the future of Rand stocks, it is more than usually difficult to speak with any degree of certainly. Most authorities, however, agree that prices can hardly go much lower, in any event. At the present levels, quotations are in most cases well below the intrinsic values of the shares, as commonly reckoned. A great war must make gold not less but more essential as a direct medium of exchange; and there is no reason to suppose that the market for the product can be cut off or access to it for long interrupted. Moreover, it is most unlikely that, under modern conditions of warfare, a European conflict can be much protracted; and it may be assumed that the endurance of the combatants will give out before the Rand can experience such a shortage in any of the supplies necessary to production as would entail a stoppage. That the crisis, even as far as it has gone, is not without serious and thought-compelling lessons for the industry and for the Union Government, is, however, a perfectly patent fact; and attention is directed to some of these lessons elsewhere. Most emphatically, also, does it bring home to us all that the unity and integrity of the Empire depends first, last and always, upon the British Fleet and it is plain that the next session of the Union Parliament will have to tackle the vexed question of establishing "a tin-pot navy" of our own or of adequately subscribing by way of insurance—to put it on the lowest ground—to the British Fleet. In any case we must now expect to see capital frightened, trade and commerce interrupted, if not dislocated and a real setback experienced in almost every sphere of business. Events in Europe, however, may take a wholly unexpected turn at any moment; and the fact makes further speculation at this juncture idle and unprofitable. For the moment, we must be content to "wait and see."

SOME LESSONS OF THE CRISIS

For South Africa, of course, the outstanding lesson of the present crisis is the need for developing her internal resources up to the point of becoming a self-supporting, self-contained economic entity. That ideal is, fortunately, not far off—certainly it is less far off to-day than ever before in the modern history of the country. In another part of this issue we attempt an examination of the ability of the mining industry to keep going through a protracted period of European war; and the lesson of that enquiry is obvious enough. So obvious is it that—whatever the result of the present crisis—we may expect a considerable fillip to the encouragement of all industries in our midst, subsidiary to mining. Cyanide, zinc, drill steel and explosives, with the essentials of their production are all involved in our consideration, and the factors governing the supply of each are as varied as they are interesting. In regard to foodstuffs and local production, particularly of meat, the outlook is most reassuring. From statistics and from other sources of information the position may be shortly summarized as follows:—There has been a remarkable reduction in the number of cattle maintained in the chief meat producing countries for the meat eating nations of the world. At the same time, and notably in Canada, the United States of America and Germany, there has been a great increase in the population, e.g., the population of Germany increased from 56,367,000 in 1900 to 64,926,000 in 1912. The United States of America has been a large exporter of beef; she is now fast approaching the stage when she will be able to support in this respect her own population only. Canada is said to be likely to be an importer of beef in the near future. Germany imported in 1907 meat to the value of £[illegible], while for the year 1912 the importation increased by £[illegible], or an increase of nearly 300 per cent. in [illegible] years. During the same period there was a small increase only in the number of cattle slaughtered. The Argentine stands out as the only country which is to-day in a position to supply the densely populated countries of Europe with their requirements in beef. What are the lessons to be derived, the conclusions to be drawn, and the importance of these figures and facts to cattle breeders in South Africa and Rhodesia? The world's supply of beef is decreasing in proportion to the population, and beef is consequently rising in price. Areas of land which in the past have been devoted to cattle farming are now split up into smaller holdings on which other more intensive mixed farming is now being pursued. In South Africa, and in Rhodesia, there are large tracts of country suitable for cattle raising. Diseases which have in the past severely decimated the herds of South Africa are now, with few exceptions, well understood, and are either being eradicated or controlled. The cattle breeder of to-day is not menaced with the same risks which formerly prevailed, and cattle breeding under good management can be pursued with success and profit. The census of cattle in South Africa gives the following figures:—Union of South Africa, 5,797,000 in 1911; Union of South Africa, 3,500,000 in 1904; or an increase of 65 per cent. over a period of seven years. In the Cape Province the increase was 39 per cent.; in Natal there was a decrease of 31 per cent., due to the ravages of East Coast fever, now happily stayed, in the Transvaal the increase was 160 per cent.; and in the Orange Free State it amounted to no less than 254 per cent. Pricing the cattle of the country at an average of £6 per head (all ages), the figure of £34,782,000 is arrived at as the valuation of the cattle within the Union of South Africa. Despite the ravages of disease the number of cattle has rapidly increased, and the extent to which the requirements of the population in regard to meat has been met is reflected in the South African statistics. In 1903, irrespective of imports to the Orange Free State, we imported beef to the value of £1,910,000 and mutton to the value of £975,000, or a total of nearly £3,000,000. In 1906 the imports were reduced to: Beef, £511,700; and mutton, £215,300; while in 1913 we imported into the Union of South Africa only £80,500 worth of beef, and £21,500 of mutton. Over a period of ten years, the imports were reduced from over £3,000,000 (including Orange Free State) to about £100,000. Those who sometimes aver that agriculture and stock breeding in South Africa are not making satisfactory progress would do well to study statistics relating to the supply of products for local consumption. The figures relating to the dairy industry also indicate progress, though perhaps not so marked. In 1903 there was imported into the Union butter and cheese to the value of £1,122,000; in 1906 this had dropped to £694,000; and in 1913 there was a further reduction to £356,000. Again, the statistics published only this week by the Government show that in 1910-11 there were 3,282,971 morgen of land under cultivation in the Union; the Cape heading the list with 974,266 morgen and the Transvaal coming second with 954,825 morgen. As the Cape is roughly two and a half times the size of the Transvaal, the amount of cultivation in the latter Province is not unsatisfactory. The Free State, however, can boast of more cultivated land in proportion to its size than any other part of the Union. In the year for which the returns were made, the Union produced 1,810,315 muids of wheat, 2,060,922 muids of oats, 407,636 muids of barley, 1,727,861 muids of maize, and 299,422 muids of Kaffir corn. Production was heaviest in the Cape, save in maize and Kaffir corn, in which the Transvaal headed the list. Amongst smaller crops the Union produced 279,495 muids of peas and beans, 1,228,256 muids of potatoes, 637,195 muids of sweet potatoes, 157,153 muids of onions, and 818,505 muids of mangle and beet. Natal supplied the country with over a million tons of sugar-cane, and more than five million pounds of tea. In addition to the 5,796,949 head of cattle already mentioned, the Union contained in 1911 over thirty million sheep, eleven million goats, and one million pigs, whilst it sold in the twelve months more than five million gallons of milk, eleven million pounds of butter, ten million pounds of cream, and half a million pounds of cheese. To these supplies must be added nearly six million bushel baskets of grapes, and huge quantities of fresh fruit, dried fruit, and raisins, etc. In this connection it will be remembered that some time ago the Transvaal Landowners' Association asked the Government to appoint a Commission to go into the whole question of meat supply in this country, and the moment seems particularly opportune to emphasise the value of such enquiry. Indeed, its scope might profitably be extended to embrace the whole question of the ability of the country to support itself. Where the South African product is failing to keep step or to maintain its natural increase might be made a subject of particular study, and the advisability of some form of bonus or bounty system to stimulate the lagging division of industry might possibly be devised. Out of evil, after all, good may come, if it teaches South Africa to be self-dependent, self-reliant, self-contained.

HOW THE WAR MAY AFFECT RAND INDUSTRY.

Commodities the Mines Import From Overseas—Possibilities of Local Manufacture —Explosives, Steel, Cyanide and Zinc—A Favourable Stock Taking—Our Gold Mines and the Sinews of War.

At the time of writing the thoughts of all men are naturally turned to Europe and to the momentous events that are being evolved out of a state and prospect of Continental war that has had no equivalent since Napoleonic times. So far the effects of the commencement of hostilities and the sinister contingency of extension of the area and Powers involved have been confined to the share market. "Kaffirs," in sympathy with all other stocks have declined to a degree that reminds one of the dark days immediately preceding the Anglo-Boer War and the total depreciation that the past eventful week has witnessed in the South African section alone of the stock market must run into millions of pounds. Undoubtedly there are many bargains to be picked up on the market at present prices, but until a marked and definite improvement in the dark outlook of Europe is clear and unmistakable it is unlikely that an upward tendency towards levels more representative of intrinsic values will be manifested. The effect of the crisis on South African shares is a consequence that is quite understandable in view of the interdependence of the finances dominated by and vested in the great Powers. But stock market depreciation is an indirect result brought about through many and diverse channels. Intrinsically the Rand's gold mines are just as valuable as they were a week ago, and a real improvement in the Continental situation would soon be manifested through the media of Bourses, Banks and the intricate supersensitive nerves of the world of finance to our own local Rialto. But in the event of the struggle for European mastery becoming so intense and enveloping as to plunge other countries than Austria and Servia into the throes of war, the effect on South Africa might well become direct and actual. Elsewhere in this issue we touch on the subject of the food supplies of the Sub-continent and the incidence of war in Europe and the necessaries of life in South Africa. We here propose briefly to discuss the possible and probable consequences of the subordination of pacific commerce to the many-armed monster of war in so far as these consequences might directly bear on the gold mining industry of the Witwatersrand. This Main Reef series of which Johannesburg is the soul and centre must have been a factor of immense importance in the martial preparations of the armed camp in Europe since by producing one-third of the gold of the world it has been an area that has provided war and the intentions of war with no small proportion of the sinews without which war is impossible. The Rand has come to occupy a place of enormous importance in the councils of finance and speculaion as to the part that it might continue to play or might, through hostility at sea, not be allowed to play in the maintenance and distribution of international strength is as fascinating a study as Mr. Norman Angel or any other economists who consider battle in terms of wealth could wish to indulge in. The future marketing of our golden produce in Europe if Europe becomes Armageddon is one aspect of the complex subject which it is here attempted to discuss—namely, the effect of a general European war on Rand industry. But this aspect is so much in the womb of the future that it had best here be left alone.

A more tangible affair is the matter of dependence on oversea supplies of material necessary for the ordered working of the mines. There are to-day no new large plants on order, and it can be safely assumed that hostilities between the big Powers of Europe and interruption of maritime traffic would only affect the Rand gold mining industry in the direction of routine supplies—*i.e.*, such supplies as are required for the ordinary everyday operation of the mines. Fortunately we are independent of overseas States in the highly important matter of power. With our enormous coal fields and electric stations the Rand has nothing to fear in respect of mechanical or electrical operation of plants. We possess, too, enough, far more than enough, lime for the requirements of ten Rands. But there are some materials which South Africa either does not possess or does not manufacture, and which are imported from various countries —principally from countries which might be involved in general European strife. The most important of these commodities are:—(1) Explosives, (2) Cyanide, (3) Zinc, (4) Steel (chiefly drill steel), (5) Mercury.

Explosives naturally occupy the first place in the list, although shortage of cyanide would probably be quite as serious as shortage of explosives. During last year the mines of the Transvaal consumed 453,128 cases of blasting gelatine, 214,566 cases of gelignite and gelatine dynamite, 68,720 cases of dynamite No. 2 and "Ligdyn," 311,861 boxes of detonators, 473,456 electric detonators or fuses, and 8,398,611 coils of safety fuse. There are within the Union three important explosives factories, viz., those of the British South Africa Explosives Company at Modderfontein (Transvaal), the De Beers Company at Somerset Strand (Cape), and of Kynoch's at Umbogintwini (south coast of Natal). During June these concerns manufactured 76,104 cases of explosives and the items imported under this head were only 122 cases. There were, however, 55,000 detonators imported. South Africa, it would thus appear, is quite able to manufacture her own requirements in regard to explosives, although there would seem to be considerable dependence on overseas industry for detonators. The outstanding fact is, however, that although the South African factories are capable of making all the explosives required by the mines there is dependence on overseas in this regard because most, if not all, of the raw materials required in manufacture are imported. It is understood that very considerable stocks are carried in the country of these raw materials; sufficient to enable the mines to prosecute operations for several months to come, but for what precise length of period it is difficult to say. Neither is much definite information obtainable as to the practicability of substituting, some at any rate, local for overseas materials in the manufacture of gelignite, etc. Disorganisation of the drill steel trade with the Sub-continent or the cutting off of supplies of this very necessary commodity altogether for a time would attack the industry in a vulnerable quarter. Last year Transvaal mines consumed 2,312,129 lbs. of bar, tool and cast steel, 12,126,582 lbs. of sheet steel, 1,783,287 lbs. of hand drill steel, and 6,182,469 lbs. of rock drill steel. The stocks of steels held locally and pending delivery are understood to be fairly large, but they would not last for anything like an indefinite period. In the event of exhaustion of present stocks and inability to secure steel from overseas, the question of local manufacture would become of prime importance, and it is quite on the cards that an industry such as that at Vereeniging would come to the rescue of the mines if conditions became sufficiently serious to compel South Africa to look after herself.

In connection with the three commodities necessary from a metallurgical point of view for the normal operation of the Rand, cyanide is undoubtedly the most important and pressing. Last year over eleven million pounds were consumed by the mines, and the consumption is roughly ·35 lbs. for each ton of ore milled. The bulk of the cyanide—about 75 per cent — which is used on the Rand, comes from Germany. England furnishes the remainder. The German trade is controlled by Messrs. Arndt & Cohn, of Hamburg, who are the sole selling agents. In Great Britain a somewhat analogous position is occupied by the British Cyanide Company, which disposes of the entire production of the Scotch and English factories. Along the Rand the usual practice of the mines is, so we understand, to hold about two months' supply in hand, and as there is generally two months' supply on the water, it is assumed that no difficulty should be experienced for three or four months. We understand that additional supplies have been ordered and that urgent steps have been taken to expedite delivery. Here again the question of local manufacture naturally calls for brief mention. The manufacture of commercial cyanide and the direction of its supply, if not a trade secret, seems to be wrapped in a good deal of mystery. We gather, however, that it is largely derived from the by-products of gasworks and the sugar industry. The latter source of origin possesses a special significance for South Africa in view of the Natal plantations. Another fact not without interest, too, is that in the pre-war years a small cyanide factory was operated at Pretoria. Necessity may be said to be the mother of manufacture as well as of invention, and no doubt if "put to it" South Africa could evolve some means of securing to her greatest industry a supply of one of that industry's most urgent necessities. The efforts made locally a few years ago to start the manufacture of cyanide on the Rand are not without interest in this connection. Zinc, as is well known, is used in the precipitation of the gold and is thus another "daily bread" need of the mines. Of zinc and zinc dust nine and a-third million pounds were used in the Transvaal last year, and the consumption of this metal for each ton of ore crushed is about one-third of a pound. Here again the Sub-continent might well look to her own resources. Plant is now undergoing erection at the [illegible] mines in the Marico district. There are, too, the large zinc-lead deposits of Broken Hill in Northern Rhodesia, and a further fact which is worth bearing in mind in this regard is that Australia is a great zinc-producing country with which trade communication could doubtless be maintained, however serious the position in Europe became. As to quicksilver there is very little to cause apprehension. Since the advent of tube mills the amount of mercury consumed has greatly declined and last year only 3,013 bottles were used by the Transvaal mines. The chief mercury-producing countries are Spain, Italy, the United States and Austria. Fairly large stocks are held along the reef, but even should supplies for amalgamation fail altogether recovery could be made entirely a matter of the precipitation and extractor houses with very little loss to the industry.

Three noteworthy points arise out of this necessarily brief enquiry into the dependence of the mines of the Rand on the outside world of unrest for supplies imperative to our industrial life. Firstly, there is the gratifying fact that in several necessities the Union is self-supporting. Secondly, the stocks here in the country or likely to be in the country very shortly are sufficient to last for at least three or four months. Thirdly, it has been shown that there are latent possibilities of manufacture which would no doubt be developed in time of stress and which might very well open up new avenues of South African commerce and in time render the Rand quite independent of the commodities obtained from overseas in normal times. And in conclusion there is a fact which this stock-taking has not evolved, yet that is of supreme importance to and bearing upon the matter under consideration. The point we wish to make—and we think few will deny it—is that should war in Europe assume such calamitous proportions as to sever our trade connections with the older world the blast of war would be so withering that the nations would soon desire the breath of peace.

KNIGHT CENTRAL.

Development South of the Dyke—Sound Financial Position.

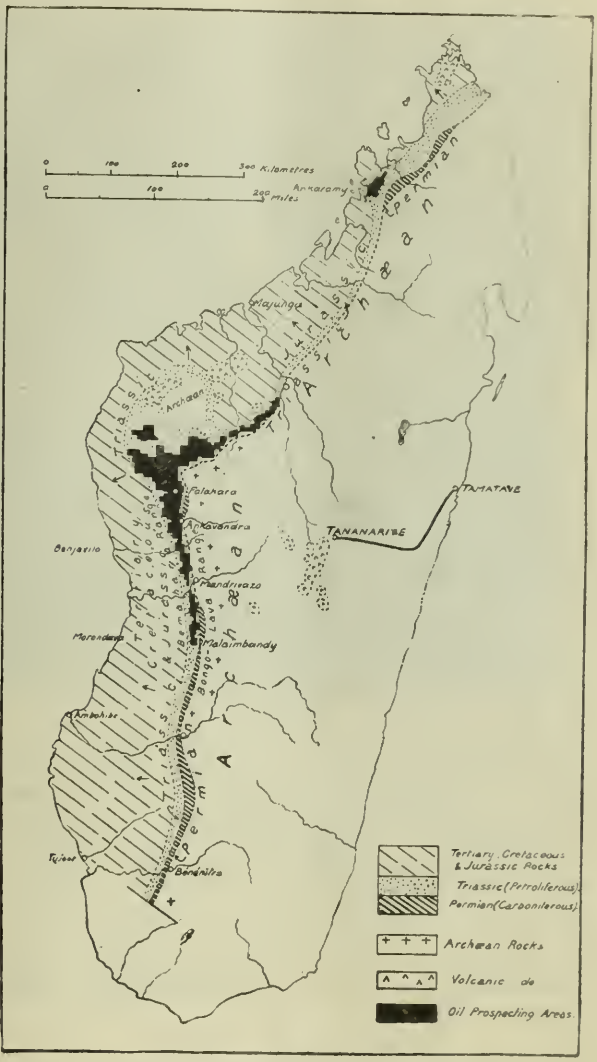
The Knight Central Company has of recent months fallen upon evil times, and it is clear that the company has encountered a section of very poor value to the south of the [illegible] dyke. This intrusion runs through the property from east to west at no great distance from the northern boundary and accordingly a large number of claims are contained in this southern area. The dyke in question upthrows the reef to the south of it about 600 feet in a similar way to that of several other Rand mines. The intrusion cuts the property into two sections, 182 claims being to the north and 677 claims to the south of it, whilst the dyke itself is estimated to cut out about 38 claims of reef ground. Recent developments in this southern area have, it is well known, been unsatisfactory, and in reply to enquiries from shareholders the directors consider it desirable to publish, without awaiting the quarterly report, the following information covering all development work done south of the dyke up to 30th June. The area south of the [illegible] dyke has been prospected by driving on the 13th and 14th levels at the west shaft, and on the 15th and 16th levels at the east shaft. The assay values from this development up to the 30th June, 1914, and corrected stoping widths, are as follows:—13th level: 1,005 feet has been driven, of which 720 feet has exposed the South Reef, 125 feet has been in dyke and broken country, and 160 feet has exposed the Main Reef. The average value of the South Reef exposed is 3·7 dwts. over 51 inches. In this distance there are two stretches of 110 feet and 180 feet, separated by a distance of 505 feet, which gave respectively 5·5 dwts. over 42 inches and 5·8 dwts. over 20 inches. The Main Reef exposed for 160 feet is at the eastern end of the drive and gave an average of [illegible] dwts. over 55 inches. 14th level: 1,580 feet have been driven, of which [illegible] feet have exposed the South Reef, 191 feet have been in dyke and broken country and 165 feet have exposed the Main Reef. The average value of the South Reef exposed is 2·7 dwts. over 65 inches. The Main Reef exposed for 165 feet is in the Western end of the drive and gave an average of [illegible] dwts. over 52 inches. 15th level: 1,160 feet have been driven, of which 895 feet have exposed the South Reef, 90 feet have been in country and 175 feet have exposed the Main Reef. The average value of the South Reef exposed is 2·7 dwts. over 26 inches. The Main Reef exposed for 175 feet gave an average of 1·4 dwts. over 47 inches. There are some stretches of reef exposed on the 14th and 15th levels which show payable values, but they are short and disconnected. 16th level: 410 feet have been driven on Main Reef, and gave an average value of 1·5 dwts. over 48 inches. The South Reef and Main Reef have also been exposed in a number of boxholes on the four levels and have given assay values similar to the above. With regard to the foregoing unsatisfactory development, the directors draw attention to the fact that the work so far done covers an area of only eleven claims, out of a total of 677 south of the dyke. The decreased profit for April, May and June was due to the shortage of native labour and decrease in value of grade milled during the last two of these months. The labour supply has been gradually improving and at date the company has seventy-four per cent. of its labour complement. As the future of the mine depends so largely on the development work south of the dyke, every effort is being made to advance this development as rapidly as possible and at every available point. This, however, does not interfere with the regular milling operations, and everything in this connection is being done to secure the best returns so as to pay, if possible, for all current and capital expenditure out of working profit and thus maintain a strong cash position which, under the circumstances, is considered essential. At 30th June, the company had £96,000 cash in hand, in addition to liquid assets consisting of stores and Victoria Falls Power shares to the amount of £17,000. The encouraging features to be noted in this official communication are the sound financial position of the company and the fact that the work so far done covers only about 1½ per cent. of the claims to the south of the dyke.

Globe and Phœnix.

The directors of the Globe and Phoenix Mining Company, Ltd., have declared a first interim dividend of 1s. 6d. per share, less income tax, in respect of the year 1914.

THE MADAGASCAR OIL FIELD.

THE accompanying sketch map is intended to show the petroliferous area on the western side of the island of Madagascar. The eastern and central portions comprise intensely folded Archaean rocks, which are marked by a long line of fracture on the western edge that extends over an enormous length of country. The Bongo-Lava mountains follow this line of fracture, and to the west of it there appear strata of comparatively recent geological age comprising beds of the Permian, Triassic, Jurassic, Cretaceous and Tertiary systems. The general dip of these beds is towards the sea, at an angle of only a few degrees. Minor folds have been observed at several points, and these constitute the anticlines regarding which so much has been written in connection with the oil discoveries in the island. The Triassic beds, which are exposed in the Betsiriry Valley, and continue north and south for many miles below the edge of the Archaean bluffs, are, as far as has been found to date, the oil carrying strata, and it is in these, of course, that exploratory borings are now being made. In the Ankavandra area the upper Trias only is in evidence, and is composed of soft sandstone, more or less coarse in texture, clays and marls with petrified wood. The middle and lower Trias are exposed more to the north. The former contains coaly sandstones, with lenses of coal, while the latter consists of sandstones and marls with frequent enclosures of marine fossils. The total thickness of the Triassic formation has been estimated at about 4,000 feet. According to M. Levat, the petroliferous section has a thickness of from 1,500 to 1,800 feet or more. The map is based on geological data in the report presented by M. David Levat to the French Minister for the Colonies and to the Governor of Madagascar. The locality of the various company areas shown in a recent issue of the *S.A. Mining Journal* is in the vicinity of the village of Folakara.



GEOLOGICAL SKETCH MAP OF MADAGASCAR.

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of June, 1914, is as follows:—Reef: Mill: Gold won (fine), 370 ozs. 0 dwts. 5 grs.; tons crushed, 873, value, £1,554 0s. 1d. Concentrates (estimated): Gold (fine), 12 ozs. 10 dwts. 19 grs.; tons, 6; value, £53 5s. 11d.; also contains silver and lead, value £23 16s. 9d. Cyanide: Gold recovered (fine), 6 ozs. 7 dwts. 5 grs.; tons, 35; value, £26 13s. 7d. Alluvial: Gold recovered (fine), 785 ozs. 3 dwts. 14 grs.; cubic metres treated, 85,000; value, £3,297 14s. 3d.

Origin of the Rand Gold.

To the issue of the *Mining and Scientific Press* to hand by this mail that well-known geologist and geographer, Professor J. W. Gregory contributes an illuminating letter on the subject of "The Rand Banket." Professor Gregory, it will be remembered, read a most valuable and closely-reasoned paper on the origin of the gold in the South African bankets before the Institution of Mining and Metallurgy a few years ago, and in his letter to the San Francisco technical journal he criticises the articles recently contributed to that paper by Mr. C. B. Horwood, in the course of which Mr. Horwood, as Prof. Gregory puts it, "re-advances that protean hypothesis—the infiltration of gold into the Rand banket." Professor Gregory is emphatically a believer in the placer origin of the precious metal, and in concluding his letter he writes:—

> Mr. Horwood's arguments for the infiltration theory appear to be not only consistent with the placer theory, but to tell in its favour. The great quantity of gold in the banket is no doubt unique, but it is also unique for a lode field, and the clastic theory most readily explains this feature. The formation of a goldfield is a process of concentration of a once diffused material. The placer theory adds an extra process by which gold, after a first concentration in the reefs of the metamorphic zone beside the Rand, was further concentrated during the denudation of the country. The placer theory gives a simple, reasonable, and natural explanation of the origin of the gold, for it attributes its source to the vast quartz-lode series that existed on the Rand before the formation of the banket: the infiltration theory, on the other hand, introduces the gold from a hypothetical and improbable source, along solution channels of which we still have no evidence, and, according to Mr. Horwood's version, at a date long after the banket had received its gold.

The auriferous prospects of Blaauwbank, the historic spot where gold was first discovered in the Transvaal, when Potchefstroom was the old capital, are again being investigated, says the Kimberley paper, and a ten-stamp battery is now at work on promising ground adjacent to the Golden Valley. Blaauwbank, with its likely-looking country, has always appealed to the prospector, and bands of gentlemen diggers have spent months camping out in the Golden Valley and sampling the alluvial streak overburden for colour. The alluvial streak, however, has been found distinctly patchy, and beyond a few nuggets and flakes of gold, now regarded like expensive trophies of the chase, nothing has come to light in recent months to reward the energetic fossickers for their pains. The new Blaauwbank Syndicate are going further afield, and their systematic development of the ground should result in thoroughly proving, or otherwise, a payable field.

MODDER B. NEW EQUIPMENT COMPLETED.

A Few of the Nissens Already Dropped—Prospect of Larger Profits in the Near Future.

A certain number of the new Nissen stamps which have been added to the milling plant of the Modderfontein B mine were dropped on Tuesday, and in the course of the next week or two it is hoped to commence work with the full new equipment, provided nothing in the nature of a shortage of native labour occurs to upset present arrangements. The mine at the moment is fairly well off in regard to labour, and as to development this continues to be as satisfactory as ever. The prospect of a considerable increase in the output and profit earning of this company in the very near future is therefore a good one, and the Modder B., which has already proved itself to be one of the most profitable mines of the Rand in the three years during which it has been a producer, is likely to take an even higher place in the list of outputs and profits than hitherto.

A Mine of Great Prospects.

In our last issue we gave some facts and figures as to the great potentialities of this mine. The mining area consists of 1,407 claims, of which 1,400 are reef-bearing, and it has always been obvious that the property could support a substantially larger milling plant than the 80 stamps and [illegible] tube mills which have hitherto been working and which have a capacity of about 34,000 or 35,000 tons per month. During last year the mill was pressed very hardly, and was at times worked beyond its capacity, giving a higher residue than that which would result by the best metallurgical practice. Several additions were therefore made to the cyanide plant, the most important being two extra slimes tanks and a clarifier, whilst two additional sand tanks were also installed. The additional stamping capacity consists of 16 new Nissen stamps and a tube mill. The expenditure on capital account of the company for this year has been estimated at £72,000, the greater proportion of which is on account of the additions to the plant. This additional plant will, it is anticipated, enable the management to increase the tonnage milled to about half a million tons per annum, or, say, a little over 40,000 tons per month. This, as a matter of fact, may be regarded as a conservative estimate, and it is not unlikely that in the near future the company will be crushing 45,000 tons per month or even more. This, however, is a matter that will have to be carefully considered in relation to extraction, and at the present moment no very definite forecast as to the amount that will be milled per month is possible.

The Company's Sound Position.

On the subject of the underground position and surface policy of the mine, it may be of interest to quote from the speech of Mr. H. W. Schumacher, delivered at the annual meeting held a few weeks ago. Speaking of last year's results Mr. Schumacher stated: "Simultaneously the payable ore reserves were increased to 2,800,400 tons, worth [illegible] per ton over an estimated stoping width of 55 inches, as compared with 2,591,000 tons worth 30s. 3d. per ton over an estimated stoping width of 54 inches at the end of 1912. The reef disclosures in 1913 which were nearly all in the western half of the mine were highly payable and developed 285,000 payable tons, of an estimated stoping value of [illegible], at an actual cost of less than 1s. per ton developed. The figures I have quoted speak for themselves and need no elaboration. I turn, therefore, to the present position and general prospects of the mine. On the surface the increase to the reduction plant should be completed within three months, and thereafter the additional tonnage crushed will be raised gradually to 40,000 tons monthly, or perhaps even a little more. The amount still to be spent on the completion of this work, and on the erection of a large new winding engine was approximately £52,000 at the beginning of this year, of which £13,000 had been expended by the end of April. The total liability, as you will notice, is far more than covered by the cash on hand at the beginning of the year. As far as we can see, capital expenditure on this mine, apart from possible additions to the plant from time to time, should be for a long while restricted to comparatively small outlays which are not likely to affect appreciably the distribution of profits to shareholders. Underground we are continuing to do excellent work, but we are still hampered by the slender force of native labour that is at our disposal. Very few other mines, I believe, except our neighbour, the New Modderfontein Company, could with less than 2,000 natives handle the tonnage that we are handling, or make the profits that we are making monthly. The amount of development work that has been done, and is still being done, is, in the circumstances, also surprising, but we have not been able to explore the eastern portion of our property and block out ore reserves there as rapidly as we would have liked. The plan that is issued with the reports for the year 1913 shows the great mass of uninterruptedly payable ore in the western portion of the mine, the poor values in the centre of the property, notably immediately above the third level, to which I referred to at the last annual general meeting, and the comparatively small amount of work done in the more easterly area of the mine owing to the disturbed and faulted ground which has been encountered there. The plan also shows the pleasing feature that the reef was payable at the bottom of the three lowest winzes in the property. These points are of particular interest, and I therefore give a summary of the values exposed below the third level up to the middle of May, 1914: In the diagonal winze the values have been erratic, and payable for nearly half the total distance of 570 feet. The central winze after starting in unpayable ground for a distance of 650 feet has disclosed the high average of 40·2 dwts. over 21·7 inches, that is 872 inch-dwts. for the lowest 450 feet. The most easterly winze below the third level averaged 19·5 dwts. over 12·8 inches for the first 350 feet, and 2·7 dwts. over 32·8 inches for the last 350 feet."

This Year's Results.

Since the end of last year the mine has continued to open up in a very satisfactory manner, whilst the profits have shown increase. In the March quarter the profit was £103,023 with expenses averaging 15s. 8d. per ton. In April a profit of £21,263 was earned, working expenditure being at the rate of 15s. 5d., whilst in May the profit was £35,483 (costs 15s. 7d.) and in June £35,135 (costs 15s. 11d.). With the new equipment in operation expenditure per ton should be reduced and the extraction improved, so that it seems reasonable to look for profits in the neighbourhood of half a million per annum at an early date.

Natal Coal: June Returns.

The following is the official coal and labour return for the month of June, 1914 (25 working days):—Natal Navigation, 20,828 (tons of 2,240 lbs.); Glencoe (Natal), 13,732; Alton Collieries, 470; Ballengeich, 2,412; Dundee Coal Company, 17,567; Dewar's Anthracite, 663; Durban Navigation, 29,008; Elandslaagte, 11,261; [illegible], 3,422; Hatting Spruit, 10,623; Hlobane, 23,679; Natal Cambrian, 10,883; Natal Steam, 1,671; Newcastle, 1,706; Ramsay, 4,161; South African, 9,897, S.A. (Vryheid) Coke, 449; Utrecht, 14,700; Wallsend (Natal), 1,932; total, 204,103. Corresponding month of 1913, 221,198. Coal bunkered and exported at Durban: Bunker coal (tons of 2,240 lbs.), 92,343 tons; coal, 34,438 tons; total, 126,781 tons; corresponding month of 1913, 156,087 tons.

THE MANAGER AND STAFF OF THE BANTJES CONSOLIDATED MINES, LTD.

Top row: F. J. Ormsby, assistant secretary; R. Murdock, reduction foreman; W. H. Brookes, assayer; I. R. Dell, acting native timekeeper T Fletcher, foreman smith; E. Fredrikson, head timekeeper; E. E. Brannigan, storekeeper.

Second row: G. Fearnley, draughtsman; W. G. N. Titley, assistant surveyor; E. C. Edyvean, shift boss; J. Fidler, foreman carpenter: A. H. Nesbitt, foreman fitter; W. H. Parker, mine captain's clerk; J. H. Beatty, shift boss; S. M. Hershfield, clerk.

Third row: H. Melville, shift boss; E. W. Denny, shift boss; J. Twinch, head sampler; N. C. Krone, surveyor; W. J. Brinton, shift boss: R. Redhead, underground native controller; F. W. Cindel, reduction officer; A. S. Gib son, shift boss.

Seated: E. G. Jones, shift boss; R. Blount, shift boss; G. Wilson, mine captain; S. Fisher, senior mine captain; W. W. Lawrie, manager H. H. Symons, mine secretary; A. C. L. Olsen, engineer; T. H. C. Garner, compound manager; W. McKenna, mine captain.

MINING AS A PROFESSION.*

(BY HENNEN JENNINGS.)

To consider man without the earliest primitive contributions of the miner and metallurgist takes us back to savagery. Man's greatest endowment is his wonderful and crafty brain cells with their latent powers of development, which has shown him the necessity of supplementing his own strength by outside aids, and then gradually and persistently obtaining the materials for his needs and fashioning them into the tools of power, and finally incorporating and making them a veritable part of his being. His first great advances were the commanding of fire, the use of stone implements, then wooden bow and arrow, By these he worked himself into the stone age, but was still brutal, weak, and with little historical recording power. It was not until he delved below the surface of the earth for materials that he was able to fashion the sword, spear, fire arms, protective armour, plough, hoe, pruning-hook, scythe, pitchfork, tires, axe, saw, plane, etc. It was only with metal tools that great agricultural development began, and it only reached its present magnitude when further supported by the metals in the form of railroads, steam vessels, harvesting machinery, etc. Mining and agriculture are the only basic productive pursuits of man, and they are both fostered each by the other, and both dependent on mother earth. The one skims her surface, the other goes deeper. Agriculture furnishes man with food for existence, but mining gives him the materials for power, art and civilization. Without metals the scientists' tools for experimentation and determination would not be possible, nor the diffusion of knowledge and thought by means of the printing press, photographic appliances, telegraph, cable, and the telephone. The mining engineer must have some sound general knowledge of all other branches of engineering inasmuch as in equipment and running of great mines and metallurgical plants he must make use of the training of engineers in almost all the other branches, and to obtain from them their best and hold their respect it is necessary for him to at least appreciate the foundations of their specialties to intelligently confer with them and decide upon merits rather than dicta. In addition, he must have special knowledge and training in all pertaining to the discovery, working and valuation of ore deposits. He must have also sound business experience and judgment to gauge the payability of new ventures, and this in turn requires that he should have had in some period of his career a successful experience of management, requiring a knowledge of accounts and faculty of handling men. In distant lands he must have general information of many kinds, and linguistic attainment. The legitimate uncertainties of mining throw peculiar temptations in his path, as these can be twisted to excuse failures of indolence and unfitness, and also be used as narcotics to conscience when temptation to dishonesty presents itself. His work, especially in metalliferous mining, is often far afield from the observances and guidance of owners or directors, and his work is not of a character that erects lasting monuments or stimulates either admiration or criticism. Thus character, industry and tact are even greater requisites for true success than brilliancy of intellect. Mining as a profession requires varied knowledge and gives scope for ability and character, and is a profession befitting the true gentleman as well as the adventurous strong man. It affords absorbing and interesting work, and, being basic and productive, extends opportunity for clean money prizes. Each branch of engineering is based upon metallic foundations; each is dependent upon the other, and none could have reached its present magnitude without the others, but the miner gives to all the other branches the materials that knit them together in common bond of usefulness, making them effective in the art of "Directing the great sources of power in nature for the use and convenience of man."

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* Abstract of a speech delivered at the fiftieth anniversary of the School of Mines, Columbia University, May 29, 1914.

OUTPUT AND PROFITS.

Transvaal Gold Mines in the First Half of 1914—Comparisons with Returns for First Six Months of 1913—Working Costs Coming Down.

It will appear somewhat anomalous that although the output, tons milled and profits of the Transvaal gold mines were lower during the first half of the current year than in the corresponding six months of 1914, the dividends for the January-June period of 1914 show a substantial increase over those of the January-June period of last year. The reason is, of course, to be found in the fact that one or two companies which did not declare dividends for the first half of 1913 are now declarant companies, whilst one or two other concerns have improved their finances to such a degree that they also have been able to distribute amounts amongst shareholders. If dividends be the real test of the industry's prosperity, then it might certainly be stated that the first six months of this year have been more satisfactory than the first six months of last year, but in comparing the returns of the two periods one has to go deeper than this and analyse other statistics.

Loss in Milling Time.

One of the first points that strikes one in such an enquiry is that relating to the number of days milling, and it is to be observed in this connection that during the first six months of this year the mines milled for eleven days less than in the 1913 period. Now the rate of output during the first six months of the year has been, roughly, £114,500 per working day. Had there been as much milling time during the first six months of the current year as during the first half of 1913 the current year's output for the first six months would on this form of calculation have amounted to about £18,619,000, which would be a decrease of under £1,100,000 instead of a decline of two and a-third millions such as there has actually been.

Recovery and Costs.

It is noticeable that the recovery per ton has been on the average 10d. less this half year than during the first six months of 1913. Against this may be set the fact that working costs have declined by 5d. per ton. This is an encouraging feature of the returns; in fact, in view of the disorganisation that took place a few months ago through the strike, it might be termed a particularly encouraging feature. During the past three months a number of important companies have effected very substantial economies in the costs of working. For instance, the working expenses of the Brakpan Mines, which were 20s. 9d. in April were reduced to 18s. 10d. in May and 17s. 11d. in June. At the City Deep the decline has been not so marked, but since April a saving of 7d. per ton has been brought about—which means a considerable amount when reflected over the large tonnage crushed by this company. The City and Suburban's expenses have been reduced by 1s. 8d. in the past three months, those of the Consolidated Main Reef by 1s. 4d., and of the East Rand Proprietary by 1s. 8d. Geduld's working expenditure has come down from 25s. 7d. to 23s. 6d. per ton. The saving at the Nourse Mines has been 11d. per ton, at the Roodepoort United 1s. 2d., and at the Van Ryn Deep 1s. 2d. per ton during the past three months. The Village Main Reef's rate of expenditure in April was 19s. 1d. per ton and in June 17s. 6d. At the Wit. Deep, despite scarcity of native labour, economy in working expenditure to the amount of 1s. 1d. per ton milled has been brought about since April. These facts encourage one in the belief that unless any difficulties at present unforeseen arise still further reductions in working expenditure will be brought about during the remaining months of this year to the consequent benefit of profit earnings.

The Profit Aspect.

The profit secured by the mines for the first six months of 1914 stands at £5,866,033, or about £900,000 less than that secured during the first six months of last year. Since April there has been marked improvement in the aggregate amounts earned. The Rand's June total was £1,025,629, as against £1,011,968 in May and £955,600 in April, whilst in regard to outside districts the profit advanced from £34,630 in April to £37,433 in May and £41,013 in June. The rate of profit disclosed during June is but little below the average for the first half of last year, a period unaffected by strikes and labour shortage. If the rate of improvement disclosed during the past two or three months is maintained it appears that the rate of earning of the first six months of last year will soon be regained if not improved on. At this juncture it looks as if the Transvaal's 1914 gold harvest will be substantially less than that of 1913, but in regard to profits the improving labour position and the recent material reductions in working expenditure cause one to hope and expect that the decline in profit will be nothing very material. Hereunder we give a list setting forth the essential features of operations during the two periods:—

	Half Year, 1914.	Half Year, 1913.
Stamps at work ...	9,694	9,999
Tube Mills at work	291	286
Days Milling	151·7	162·6
Duty per Stamp	8·78	8·77
Tons Milled	12,637,971	13,883,192
Output (ozs.)	4,086,847	4,640,421
Output (£)	17,359,824	19,711,256
Value per ton Milled ...	27s. 2d.	28s. 0d.
Working Costs	11,048,887	12,416,091
Working Costs per ton ...	17s. 6d.	17s. 11d.
Working Profit	5,866,033	6,762,266
Working Profit per ton .	9s. 4d.	9s. 9d.
Dividends (£)	4,215,729	4,164,143

Royal Commission on Metalliferous Mines and Quarries.

The British Royal Commission on Metalliferous Mines and Quarries was formed in May, 1907, and after a lengthy and exhaustive enquiry they have now issued a Report giving suggestions for new legislation. It will be remembered that the Commission, under the chairmanship of Sir Henry Cunynghame, had its original powers enlarged in May, 1910, in order to cover these undertakings, and the terms of reference covered all quarries and all mines not under the Coal Mines Act. There can be no question that a simplification of the law in the United Kingdom respecting metalliferous mines and quarries is most desirable. It was inevitable that the Commission should have kept in view throughout the enquiry the possibility of modelling these statutes upon the lines of the Coal Mines Act. It is clear from this Report that any extensive adaptation in this direction is impossible not only on account of the very diverse conditions of working, but still more on the score of expense. The industries concerned are, as compared with British coal mining, poor and hard pressed. To load them to anything like the same extent as the colliery owners, would simply be their complete ruin. The Commissioners recognise this fact, and they state in their Report that, although they have not dealt with the financial aspects of the mining and quarrying industries, sufficient facts have been brought to their notice to make them feel that it is desirable that no more expense should be caused in the working than is absolutely necessary.

THE ECONOMIC USE OF WORKMEN ON THE RAND.—II.

Continuation of Mr. E. J. Way's Thoughtful Paper.

ATTRACTIVENESS OF LABOUR OR OTHERWISE.

LABOUR markets should be open to all, but they must be made sufficiently attractive. What, then, is the matter with the market on these fields which necessitates the spending of such large sums upon native recruiting. It is not so at Kimberley, where recruiting is unknown, and the natives pay to be passed into the compounds there. Why is this? Because the Kimberley mines present to the native and the coloured man, as nearly as their education teaches them, ideal conditions for the sale of their commodity, namely, work, and because they get a better equivalent for their services than is offered by any other employer of labour on such a scale. This lesson should be taken to heart and examined. On the Witwatersrand we find: (a) Remuneration for the native is on fixed lines and incentive is not offered for industrial effort, except in a certain few cases. (b) The white man, in many cases, wins the reward, not of his own exertions, but of those of the native. (c) Living conditions are not what they ought to be. Home life is absent; locations may be looked upon as an honest attempt to meet the difficulty, but they are not upon broad enough lines. (d) Health conditions are not what they should be. (e) There is a lack of recreation provided. The reply to all this, from a certain section, would be: " Do away entirely with the native and you will do away with the difficulties surrounding his employment, and let the mines be run entirely by white people." Fortunately such an injustice to the black and coloured races is economically impossible; for we find that in the evidence given before the Economic Commission in an Annexure to the statement on Minimum Wage (Statement No. 5), data were submitted on behalf of the Tarnsvaal Chamber of Mines to the Select Committee of the House of Assembly, in April, 1913, by Professor Lawn, which in effect show that the industry as an industry could not survive an all-white policy. There is not time to deal in detail with this carefully prepared document, nor is it necessary, as it has never been proved incorrect.

RELATION OF THIS POSITION TO MINING INDUSTRY.

The importance of the whole position is its relation to the direct prosperity of the Witwatersrand Industry. Mines are shut down, some are working on a very low margin of profit, and there are valuable areas which are unexploited because sufficient encouragement cannot be given to provide capital. And when the reasons for this are examined it is found that labour on the Witwatersrand Fields is being wasted, and particularly white labour. It is useless for the White Labour politician to say that equal opportunity for the black man would oust the white. It is certain that it would largely reduce the numbers of whites employed on individual concerns, but the low rate of working costs thus brought about would cause work to be found for the white man so put out of employment, together with many others, in opening up further ventures of a similar nature which are now untouched. And it must be borne in mind that many other industries which are languishing or non-existent to-day would become profitable through the increased efficiency obtained from all classes of workmen.

INCREASED SCOPE OF RESPONSIBILITY FOR THE NATIVE.

With regard to the effect of the gradual enlargement of the scope of responsibility for the native, and in support of my views with regard to the capacity of the black and coloured man, I am indebted to Mr. H. M. Taberer, General Superintendent, Native Recruiting Corporation, for the following facts and considerations bearing upon the subject. He strongly urges that for the successful employment of large bodies of black and coloured workers they should be given piece or contract work as much as possible, and that their supervisors should be under day's pay conditions only, as at Kimberley. He advises that everything should be done to ensure the native coming to these gold fields as a voluntary and contented workman, and to do away with the general principles of recruiting as now understood. He considers that many of the difficulties with regard to the supply and handling of native labour are due to the " failure of the industry as a whole to study the development of the native in his social and economic conditions and in industrial progress." He further says:—" It can assuredly be assumed that many natives have become efficient in the various classes of mine work at which they have laboured, yet not only are employers debarred under severe penalties from monetarily recognising any individual effort of a native, but a strong sentimental and legal colour bar militates against advancing any native so that he may be classified as superior to his ordinary unskilled countrymen. This bar is largely sentimental and political, and it has greatly deteriorated the white man's efficiency. The white man does not look for employment as an unskilled labourer, and it is only through a long period of experience at rough work that a workman can become really efficient. The consequence is that a very large number of Europeans employed as supervisors on Witwatersrand mines are inefficient, and could be readily replaced by natives whose application to work has already produced efficiency. That all supervision should be performed by white men is unnecessary and economically bad. The native is in the country and is the worker; his desire for, and application to, education are remarkable; and his assimilation in every phase of life, even at work, to his superiors, is an asset which on the Transvaal mines is not taken advantage of. He is given no scope, no inducement whatever to become a constant and economic factor in the working industry; his colour is his handicap." The natives from the Cape Province have shown rapid advancement, and yet until a few years back were not wanted on the gold mines. But in other parts of South Africa and at other professions these same natives are able to aspire to responsible positions. In order that better use of the native may be had, it is desirable to cease giving contract work to Europeans, and, instead, to give piecework to the natives, who are the actual operators. This system of permitting natives to earn according to their capacity should be introduced wherever possible, and the existing restriction of the earning power of natives on piecework to any average maximum pay per shift must be removed. " By so doing greater tonnage per native will be produced, less natives will be required on existing mines, and this will justify expansion of the industry and the employment of more Europeans of a better class than those needlessly employed to-day. Were the foregoing recognition of the native labourer effected, the recruiting of natives, as carried on in British South Africa, would, before long, become unnecessary. The recruiting ground of natives should be at the place where work can be obtained. Pay and general conditions must be the attraction, when all that will be necessary should be the employment of officers to facilitate railway journeys from native territories and periodical tours by responsible officers to publish conditions of work and wages to natives at their homes."

Prior to 1908 the Kimberley mines, like the Witwatersrand Gold Fields, had all their European miners on contract with their natives on day's pay; the change to the present system, viz., day's pay to whites and contracts to natives, has resulted in a marked improvement in the efficiency of the European supervisors employed. It has also resulted in the natives becoming more efficient and earning higher wages, enabling the industry to do without active recruiting and to reduce the cost of production. The De Beers Consolidated Mines only employ two Europeans on small salaries, who advance to natives desiring work on their mines, rail fares and food for the road. These moneys are refunded by the natives. The advancing agent in Basutoland is paid 5s. by each native for his trouble in asssiting him to get work, and receives no pay from De Beers Consolidated Mines. At the Docks, at Capetown, where from 500 to 700 natives are employed daily loading and discharging cargo, coaling, etc., the average wage is 4s. per shift of 8½ hours per diem and five hours on Saturdays. Native trimmers are paid 5s. per shift, sorters 4s. 6d., and seranges (boss boys) 5s. to 8s. per shift. Out of this wage food cots 8½d. per diem, and rent of room in compound 2½d. per diem. All overtime work is paid for at 9d. per hour. European workers frequently present themselves at the Capetown Docks to obtain labour amongst the natives, and when employed are paid at the same rates as the natives, although, owing to their general inability to compete with the natives, they are not too welcome. A comparison of the wages earned by natives on the Gold Fields with those earned at the Capetown Docks and at the Diamond Mines in Kimberley, makes it natural that they should prefer to work at the latter places, especially as the gold mines are further handicapped by the more dangerous nature of the underground work and by the irresponsibility and inefficiency of a large number of European gangers, who are economically an unneecssary barrier between the native who is gradually becoming skilled and the essential competent European supervisor. " It will be noted how, especially at the Capetown Docks, there is an absence of the sentimental colour bar, and a native can, *ceteris paribus*, earn as much as a European." That the payment of natives according to capacity is attractive is proved by the fact that to-day the majority desire hand-drilling work. Even the Cape Colony natives, who in the earlier years of the industry, were reported to be averse to underground work, to-day are most anxious to perform underground drilling. While it may be argued that to reduce European supervision on mines, especially underground, would result in many more accidents, " it is not improbable that the very opposite would be the result. Natives, through generations of life in the wilds, where they are continuously in dread of danger, are by intuition keenly perceptive where such threatens, and they are instinctively apt in taking the proper precautionary measures to avoid accidents." The attempt to keep the native as an unskilled worker always assisting incompetent or even competent Europeans, appears not only unjust but economically bad. While natives and Europeans are employed side by side their respective capacities should determine the relative positions they are to occupy in the economic fabric. The natives to-day hold the key to the labour position; they are keenly alive to the disabilities under which they are working and resent them greatly. Let it be hoped that the industry will at once ameliorate their position before any upheaval occurs, of which it has lately been set an example by the recent strikes. These views, coming from such a source, deserve careful thought.

Good Finds at Droogveld and Bloemhof.

Last week a digger had a capital find on the Droogveld Estate, turning up a stone weighing 119½ carats, valued at over £1,200 A 24¼ carat diamond was found by a man named Hening at Bloemhof, also a beautiful stone weighing 16½ carats, the latter being of good shape and colour. Good finds are also reported from the Limekilns Rush.

Rhodesian Section.

LATEST MINING NEWS.

Nissens for the Eileen Alannah—A New Bulawayo Discovery—The Planet-Arcturus—The Agnes—The Pondo.

It is reported from Gatooma that the Eileen Alannah mine is about to instal twelve Nissen stamps on that property.

* * * *

The mining correspondent of the *Rhodesian* writes:—The infrequency of mining discoveries through actual systematic exploration often gives rise to the idea that luck is the most essential factor in prospecting in Rhodesia; indeed, I have known but few rich strikes to be made by men who have been working either on geological observations or practical experience. In almost every instance chance has played a great part in most of our important gold discoveries. The most recent of these fortuitous finds is the Wolley Dog, three miles north of Bulawayo, first indications of which were stumbled across by Mr. Davis in an ant-bear hole, a portion of the reef having actually been exposed by the animal. Early development of the property seemed to point to the existence of a mere pocket of fairly rich ore, and from this some 60 tons were stoped and crushed, for a return of 120 ozs. Further prospecting work has, however, disclosed a strike exceeding 300 feet, on which three excellent shoots are being developed. On either end the values run up to 2 ozs. per ton, while a small central section is panning as high as 20 ozs. and gives an average in the mill of 6 to 7 ozs. At this point the reef is small, but in a winze on the north-east shoot the reef has opened out to 30 inches at 70 feet and is panning 30 dwts. The owner has commenced sinking a 7 x 5 ft. vertical shaft from which to carry on development work at depth. Last month 150 tons of ore were crushed for a return of 500 ozs., the tailings from the ore being worth [illegible], so that the value of the ore is somewhere over 4 ozs. and the reef rivals the Lonely and Masterpiece in their most [illegible] days. For the present the owner is crushing with a Tremain plant, and will continue development of the mine in order to prepare for the erection of a Dreadnought mill of 25 tons daily capacity, which is now under order. The inventor and patentee, Mr. W. Wright, is now on his way to England to supervise and test the first of these mills, which for twelve months he has been perfecting from experience gained with an experimental mill erected last year.

* * * *

The latest development report of the Planet-Arcturus Company shows 333,000 tons in sight, value 12½ dwts., or say £[illegible] worth of gold. The mines are therefore ready for a large plant installation and the necessary funds for this purpose and for the sinking and equipment of a new main shaft have been arranged for with the Goldfields Company. The ore to be treated present no metallurgical features out of the common.

* * * *

On the 180ft. level the Agnes mine (Gatooma district) is doing particularly well. Work is being carried out from the new vertical two-way shaft which was sunk recently. The reef has now been developed over a 400ft. strike of pay ore and there is still a large strike of promising undeveloped ground. The erection of twenty stamps on the mine is contemplated for the near future.

* * * *

A trial crushing of twenty tons of ore from the Pondo mine has taken place at Mr. C. Lusat's battery on the Welcome Block. 9.55 ozs. bullion were obtained over the plates, valued £[illegible]. The sands have been assayed, giving 8.8 dwts. A much larger milling width has been opened up in the stopes, and the consulting engineer is very satisfied at the results.

The latest Rhodesian enterprise to be registered in London rejoices in the title of the "Tip Top Gold Mining Co., Ltd." This company was registered on June 29, with a capital of £30,000 in 5s. shares, to acquire freehold and other farms, mines, mineral, and other properties and rights in South Africa or elsewhere, to adopt two agreements with the Mayo (Rhodesia) Development Company (1908), Ltd., and to carry on the business of gold and general miners, prospectors, explorers, metallurgists, etc. Private company. The number of directors is not to be less than three nor more than five; the subscribers are to appoint the first, subject to the right of Arthur P. Palmer, while holding 4,000 shares, to nominate a director. Remuneration, 1½ guineas each per board meeting attended (Chairman, 2 guineas). Registered office: 110, Bishopsgate, E.C.

Lonely Reef G.M. Co.

The following are the particulars of the output of gold from the Lonely Mine for the month of June:—Mill ran 28·93 days, crushed 5,750 tons; yield of fine gold, 1,079·115 ozs., value £4,536 8s. 7d.; slimes treated, 5,750 tons; yield of fine gold, 2,920·391 ozs., value £12,279 3s. 9d.; total recovery of fine gold, 3,999·506 ozs.; total value, £16,815 12s. 4d.; estimated profit, £8,715.

British South Africa Co.

Sir L. Starr Jameson (President) has issued the following circular: "The board of the British South Africa Company has found it necessary to postpone the annual general meeting which, as indicated in its communication to the Press of the 28th February last, it was intended to hold during the present month. As the shareholders are aware, His Majesty's Government, under the terms of the Charter, is entitled to review, on the 29th October next, such of the provisions of the Charter as relate to administrative and public matters. His Majesty's Government have also thought it desirable, with the concurrence of the board, to refer to the Judicial Committee of the Privy Council for final determination certain questions which have been raised as regards the company's ownership of its land. At a moment when both these questions are *sub judice*, and the directors have received from His Majesty's Government no information as to their views or intentions, it is obvious that it would be highly inexpedient to invite public discussion of them, such as must necessarily take place at a general meeting of shareholders. It is hoped that a settlement may be arrived at within the next few months, and that we may be able to meet the shareholders early in November. The confidence of the board in the great value of the assets and undertakings, and in the opportunities that present themselves for the prosecution of an energetic programme of profitable development, has been strengthened during the period that has elapsed since the last meeting. Developments already initiated are being actively carried on and expanded. It has not been thought necessary to retard them in any way pending the settlement of the questions to which I have referred above. In pursuance of the settled policy of the board announced at the last meeting, held while Mr. Maguire was visiting Rhodesia, personal visits of directors to the territory have continued to take place. Mr. Malcolm, Mr. Wilson Fox and I have but lately returned from such visits, and the Marquess of Winchester and Colonel Baring propose to sail for Rhodesia at an early date. The commercial results as a whole for the year ended March 31, 1913, exhibit an improvement over those of the previous year and show an increased surplus of revenue over expenditure. The working capital in cash and liquid assets stood on June 2, 1914, at £1,741,370. The dividend about to be declared by Rhodesia Railways Trust, Ltd., will bring to the company for the first time a return on its large holding of shares."

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RHODESIA'S MINERAL OUTPUT.

Details for June—Record Yield of Gold.—Some Excellent Returns.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of June, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Aberdeen (Cumings & Berry)	(3)	75	27·19	114
Alexandra (J. Stewart), May-June	2	100	82·06	345
Antelope G.M. (Rhod.), Ltd.	2BM2P1T	3,812	1,247·38	5,239
Do. (slimes)	—	2,507	1,056·35	4,437
Atlas (Est. R. Barkley, decd.)	10	741	142·42	598
Do. (sands)	—	500	24·32	102
At Last (J. F. Smith)	3	45	30·02	126
Basch (Morrison & Granger)	5	255	52·55	221
Bembesi 1 (Ding Dong Syndicate)	2	95	13·74	58
Big Ben (W. E. Hunt)	4	142	84·07	353
Do. (sands)	—	110	29·86	125
Blanket (Forbes Rhod. Synd., Ltd.)	15	830	135·55	569
Bobs (F. W. Spencer)	5 1C	190	22·25	93
Borrow (W. H. Robinson)	3	240	32·39	136
Bucks & Prestwood (J. Black)	5	793	244·69	1,028
Do. (sands)	–	375	37·59	158
Burton (S. H. Burns), May-June (sands)	—	1,200	72·12	303
Bushtick Mines, Ltd.	20.8Nis3T	6,083	281·79	1,183
Do. (sands)	—	3,339	468·26	1,967
Do. (slimes)	—	2,851	225·56	947
"C" (D. & C. Syndicate)	10 1C	1,889	113·56	477
Do. (sands)	—	1,605	85·15	358
Do. (slimes)	—	284	42·51	179
Claremont (B. L. Whyte)	5.2Nis	1.093	98·98	416
Colleen Bawn (Colleen Bawn Syndicate, Ltd.)	6 2P	739	99·78	419
Do. (sands)	—	465	63·15	265
Do. (slimes)	—	568	65·17	274
Criterion Gold Mines, Ltd.	10	1,390	234·39	984
Do. (sands)	—	1,008	80·48	338
Eagle A. (Macdonald & Co.)	10	682	184·79	776
Do. (sands)	—	272	21·93	92
Elumba A. (Cooper & Bosomworth)	—	625	152·23	639
Do. (sands)	—	300	81·60	343
Euphorbia (D. W. K. Syndicate)	111	40	11·29	47
Farvic (H. S. Henderson)	5	726	634·90	2.667
Do. (sands)	—	461	54·52	229
Flora (E. E. Beecroft)	5	560	191·37	804
Fred (Transvaal & Rhod. Est., Ltd.)	10 2P	1,700	829·29	3,483
Do. (sands)	—	1,700	292·17	1.227
Godwin B. (Barrett & Stacey)	5	115	208·86	852
Do. (sands)	—	214	48·19	202
Golden Butterfly (Wheeler, Davis & Rintoul)	5 1P	470	122·09	513
Do. (concentrates)	—	3	16·55	69
Intabanenda (Est. B. Smallie, decd.)	5	127	26·87	113
Imbusine (Cumings & Berry), sands	—	225	30·06	126
Ivor (Triggs & Huntley)	(5)	96	40·81	171
Jameson (T. Berwitz)	2	55	20·32	85
Jeffs 1E (Hortor & Strong)	3	125	295·13	1,240
Jumpers (J. P. McCay)	5	560	236·82	995
Do. (sands)	—	330	90·79	381
Kameel (Yellow Jacket Synd.)	5	508	112·97	474
Last Luck (G. Reynolds), pannings	—	—	·36	1
Laxey (Manx Syndicate), clean up	—	–	23·96	101
Limes (Wensdorf & Zotta), May-June	—	500	84·39	354
Lone Hand (Armstrong, Furber & Alexander)	5	383	133·31	560
Do. (sands)	—	230	40·50	170
Lonely Reef G.M. Co., Ltd.	20 3T	5,750	1,079·11	4,532
Do. (slimes)	—	5.750	2,920·39	12,266
Long John (Susanna Mines, Ltd., and B. E. Co., Ltd.)	13	853	65·67	276
Do. (sands)	—	480	64·11	269
Do. (slimes)	—	230	19·98	84
Mamba (J. M. Stone)	5	65	44·73	188
March Past (S. H. Burns), sands	—	300	38·95	164
Mary & Alice (R. Dodman)	3	40	13·03	55
Master Cecil (Master Cecil Synd.)	2	6	5·09	21
Matabele Queen's Co., Ltd.	10	1,610	248·16	1,042
Do. (sands)	—	1,610	375·69	1,578
Do. (slimes)	—	465	50·68	213
Minnie's Luck (C. M. Reid)	5	500	62·58	263
Namaqua (T. W. Angus)	2	150	23·28	98
New Eclipse (J. R. Stewart)	5	978	179·27	753
Do. (sands)	—	280	20·24	85
New Jess 1 (M. & G. Hogg)	2	150	204·31	858
Northern Star (Northern Star Syd.)	10	303	84·38	354
Old Nic (Chart. (Gen. E. & F. Co., Ltd.)	15 4P	1,048	514·65	2,162
Do. (sands)	—	691	195·25	820
Old Caledonia (J. Parkhurst)	(5)	79	14·40	60
Peach A. (Peach Syndicate)	5	160	306·54	1,287
Penzance (Penzance Trib. Synd.)	2	160	42·49	178
Do. (sands)	—	80	25·76	108
Planet (Triggs & Huntley)	5	217	22·53	95
Princess (C. A. Abbott)	2	233	92·10	387
Riverside (R. Martindale)	2	30	14·46	61
Roan (J. Robinson), April and June	2	305	85·31	358
Rous 1 (A. G. Hadingham)	2	140	199·64	838
Sabi (Rhod. Cons., Ltd.), clean up	—	—	2·13	9
Sabi Extra (R. T. Bain), May-Juno	—	222	69·70	293
Sara (Cooper & Johanson)	2	130	59·40	249
Star (Romola Nigel G.M. Co., Ltd.)	5	230	58·29	245
Do. (sands)	—	300	36·10	152
Susanna Mines, Ltd.	(13)	600	77·70	326
Do. (sands)	—	450	68·23	287
Do. (slimes)	—	247	21·47	90
Teutonic (Macdonald & Bonshor)	5	545	557·95	2,343
Do. (sands)	—	140	3·66	15
Tuff Nut (King's Synd.), slimes	–	284	37·67	158
Umvoti (Henderson & Toshack)	—	300	132·54	557
Winifred (Exchange Syndicate)	5	446	155·96	655
Do. (sands)	—	226	42·55	179
Wolley Dog (P. H. Davis)	(2)	150	497·30	2,089
Zealandia (J. Millin), May June	5	500	154·04	647
Bulawayo district total			18,160·88	76,273
Gwelo District—				
Alderman (Williams & Woodger)	3	160	98·33	413
Ardpatrick (B. Frau)	3	387	179·78	755
Arizona 2S. (L. R. Evans), clean up	—	—	15·10	63
Bedad (A. & B. Syndicate)	5	200	56·20	236
Do. (sands)	—	395	20·92	88
Bell Reef Dev. Co., Ltd.	2BM 1T	3,182	1,823·90	7,660
Bonsor (Cornish Syndicate)	20	3,500	267·43	1,123
Do. (sands)	–	1,540	36·85	155
Cactus (Renton & Gray)	5	420	97·42	409
Do. (sands)	—	390	67·81	285
Camelia (S. Levin)	5	742	321·83	1,352
Cinderella (P. Burt)	E	280	40·28	169
Collingwood (Pini & Wearing)	5	421	95·22	400
Csardas (Wolfshall Syndicate)	10	560	568·52	2,388
Do. (sands)	—	420	89·95	378
Do. (slimes)	—	140	15·75	66
Delegates (O. Hardy), May	2	16	3·99	17
Eileen (M. L. Price)	5	300	47·43	199
Do. (sands)	—	320	10·84	46
Fenella (J. Kinrade)	5	28	14·83	62
Gaika G.M. Co., Ltd.	5 1C	3.100	1,422·91	5.976
Do. (sands)	—	1,491	100·41	422
Do. (slimes)	—	1,924	145·69	612
Glen Rosa (D. H. Curry)	2	161	115·13	484
Globe and Phoenix G.M. Co., Ltd.	40 10P	6,117	7,466·48	32,154
Do. (sands)	—	4,557	1,000·15	4,221
Do. (concentrates)	—	235	656·46	2,827
Do. (slimes)	—	2,446	689·32	2.963
Gothic and Pagamesa (Mashonaland Agency, Ltd.)	15 2P	1,300	384·36	1.630
Do. (sands)	—	1,595	161·81	696
Do. (slimes)	–	381	86·00	355
Invulnerable (W. H. Steele)	5	151	30·02	126
Do. (sands)	—	100	11·37	48
Kaka Main (I. Malcham)	5	409	99·05	416
Little Blossom (J. Hazlehurst)	2	150	86·90	365
Moonie River (Yellow Jacket Syndicate), sands	—	200	11·95	50
Moss (James & Morrisby)	2	406	243·19	1.021
Do. (sands)	–	408	33·20	139
Maltum (W. Cock)	3	110	9·08	38
Paradox (J. T. Woods)	–	200	4·85	20
Pompei (Bolt & Franks)	5	400	81·50	342
Redhill (Redhill Dev. Synd., Ltd.)	1 C	2,974	75·22	316
Do. (sands)	–	1,560	99·67	419
Rose of Sharon (Crampin & Masters)	10	1,000	169·31	711
Do. (sands)	—	250	17·55	74
Somerset (D. & J. Laing)	2	120	57·02	239
Do. (sands)	—	80	86·92	365
Tebekwe B. (A. N. Tyrrell)	15	925	178·23	749
Tebekwe 1 (A. N. Tyrrell)	15	929	205·94	865
Tebekwe B (H. C. Baker)	5	600	34·54	145
Vista (J. M. Haynar)	2	20	26·74	112
Wanderer (Selukwe) G.M., Ltd.	4 GR	12,090	1,718·77	7,219

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Warner (Yellow Jack Synd.), sands	—	200	7·18	30
Watch (T. Pedlow)	5	50	27·33	115
Welcome Back (F. C. Luxat)	2 1H	905	170·50	716
Do. (sands)	—	610	38·91	163
Yankee Doodle (Bruhns & Schwarz)	1[illegible]	1,455	253·08	1,063
Do. (sands)	—	1,082	137·95	579
Gwelo district total			20,017·12	85,049
Matabeleland total			38,178,00 ozs.	
Value			£161,322	

MASHONALAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
HARTLEY DISTRICT.—				
Acorn Gold Mines, Ltd.	5	409	125·28	526
Do. (sands)	—	200	58·29	245
Agnes (P. S. Triggs)	5	450	175·90	739
Do. (sands)	—	200	12·28	52
Alabama (Alabama Syndicate)	3	240	50·03	210
Baltimore & Virginia (P. A. Eckle)	1Pn	[illegible]	69·00	290
Brilliant (Mabel's Luck Synd.)	5 1P	799	495·37	2 081
Do. (sands)	—	310	163·04	685
Do. (slimes)	—	489		
Brompton (R. R. Aitken)	(5)	400	110·30	463
Do. (sands)	—	320	41·51	174
Cam & Motor G.M. Co., Ltd.	Roasting	[illegible]	3,565·90	15,205
Cheshire Cat (Arnold & Windley)	5 1P	300	161·92	680
Do. (sands)	—	325	38·64	162
Do. (slimes)	—	132		
Concession (C. E. Sampson)	5 1C 2P	2,596	462·30	1,942
Do. (sands)	—	1,608	115·67	486
Cuba (Est. C. C. Hendrie, dec'd.)	—	—	·10	1
Daisy (Macdonald & Sale)	5	925	50·21	216
Do. (sands)	—	500	119·07	500
Do. (slimes)	—	415		
Daisy 1W. & Whitlock (Macdonald & Sale)	5	54[illegible]	98·63	415
Do. (sands)	—	270	63·74	268
Dreadnought (W. E. [illegible])	1C	474	183·36	770
Eiffel Blue (Willoughby's Cons. Co., Ltd.)	10	1,300	506·99	2,138
Do. (sands)	—	836	44·14	185
[illegible] Mining Co., Ltd.	10	2,047	982·37	4,126
[illegible] Ext. ([illegible] & Goodyer)	5	585	105·21	442
Do. (sands)	—	416	43·43	182
Giant Mines of Rhodesia, Ltd.	30 2T	7,658	1,017·18	4,315
[illegible] Mines, Ltd.	5	580	161·73	679
Do. (sands)	—	300	43·55	183
[illegible] No. 3 ([illegible] Mines, Ltd.)	5	550	156·78	658
Golden Valley (J. Mack & Co.)	10	1,124	295·95	1,243
Do. (sands)	—	684	53·99	227
[illegible] No. [illegible] (L. Heilman)	2	232	59·82	251
[illegible] (Harris & Smith)	10	1,000	148·02	623
Do. (sands)	—	600	43·46	182
James Palmer (Crown Syndicate)	2	120	28·73	121
Do. (sands)	—	100	14·20	60
Karyemba (Karyemba Synd.)	5	515	443·33	1,862
Do. (sands)	—	120	50·45	212
[illegible] No. 1 (A. D. Bentley)	2	100	48·42	203
[illegible] 1 (Barnes & Erickson)	2	60	14·74	62
[illegible] (A. [illegible])	(5)	53	24·79	104
[illegible] ([illegible] & Talbot)	By prod	—	13·91	58
[illegible] (H. Moser)	5	694	75·02	315
[illegible] (B. C. Moyse)	(2)	171	118·34	497
Norman (Fraser & McBean)	2	290	108·82	457
[illegible] (D. T. de Villiers)	3	250	70·50	296
[illegible] 17 (St. Kilda Syndicate)	3	21	39·39	165
Owl (A. [illegible])	10	1,430	477·35	2 005
Do. (sands)	—	1,212	238·47	1,001
[illegible] Gold Mines, Ltd.	10 1C	3,091	452·76	1,902
Do. (sands)	—	1,643	286·67	1,204
Do. (slimes)	—	1,357		
[illegible] (F. K[illegible])	5	32[illegible]	117·21	492
[illegible] (A. J. F. [illegible])	5	[illegible]	41·95	176
[illegible] (Arnold & Windley)	5	427	130·48	546
Do. (sands)	—	300	25·59	107
[illegible] ([illegible] (Rhod.) Co., Ltd.)	5 1T	920	306·34	1,287
Do. (sands)	—	920	155·1[illegible]	651
[illegible] & [illegible] Mines, Ltd.)	5	168	[illegible]	2 017
[illegible] G.M., Ltd.	[illegible]	3,420	[illegible]	[illegible]
Do. (sands)		2,6[illegible]	171·66	721
Do. (slimes)		7[illegible]	[illegible]	[illegible]
[illegible] (S. O. Howell)	3	1[illegible]7	66·87	281
Village Main (Fraser & Buchanan)	5	250	64·14	269
[illegible] (C. Talbot)	5	75	28·39	119
Do. (sands)	—	60	3·64	15
Washington (I. J. [illegible])	5	480	312·58	1,313
Do. (sands)	—	400	51·23	215
Do. (slimes)	—	500	23·44	98
Hartley district total			15,175·74	63,928

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
LOMAGUNDI DISTRICT.—				
Alluvial (E. A. Warry)	—	—	13·35	56
Do. (G. Blacklaws)	—	—	39·81	167
Eldorado Banket G.M. Co., Ltd.	15 1C 4P	4,893	1,513·10	6,355
Do. (sands)	—	5,390	731·40	3,072
Linnet (A. R. Morkel)	2 Nissen.	448	46·24	194
May (May Syndicate, Ltd.)	5	250	30·36	128
Do. (sands)	—	240	25·79	108
Mediteraneo (Perat & Baburizza)	2	96	23·16	97
Do. (sands)	—	400	19·57	82
Medway (F. L. Standen)	5	321	64·44	271
Lomagundi district total			2,507·22	10,530
MAZOE DISTRICT.—				
Botha II. (Cunningham & Allison)	5	1,571	74·35	312
Do. (sands)	—	600	91·00	382
Day Dawn (A. Trusson)	2	111	103·21	433
Glandore (Harries & Cooke)	—	200	94·70	398
Jumbo G.M. Co., Ltd.	30	3,000	557·58	2,370
Do. (sands)	—	2,058	253·31	1,077
Do. (slimes)	—	1,066	117·11	498
Kimberley (Mash.) G.M. Co., Ltd.	8Nis.2TT	4,700	910·58	3,861
Do. (sands)	—	1,700	372·93	1,561
Do. (slimes)	—	3,000	329·00	1,376
Lowland Chief (Brico & Quick)	Pannings	—	2·88	12
Micky (Micky Syndicate)	2	390	161·67	679
Mitre (Bishop's Syndicate)	1D	14	9·55	40
Do. (sands)	—	24	18·33	77
Pompei A. (A. S. Warwick)	5	884	44·86	188
Puff Adder (Puff Adder Syndicate)	2	156	27·62	116
Do. (sands)	—	396	40·05	168
Ravine (H. O. Coker)	2	220	67·42	283
Rosary (R. Ricardo)	1D	7	9·48	40
Tat (Occola G.M. Co., Ltd.)	5	440	126·97	533
Do. (sands)	—	191	19·60	82
Venus (Giles & Southey)	2	193	81·77	343
Xmas 1 N.W. (D. Pearce)	2	220	39·98	168
Mazoe district total			3,553·95	14,997
SALISBURY DISTRICT.—				
Alpes (P. Zaffere)	5	211	252·10	591
Arab (Arab Syndicate)	10	7	7·03	30
Arcturus (L. Chiappini), sands	—	600	65·28	274
Ceylon (Monarch (Tati) G.M. Syndicate, Ltd.)	5	734	130·89	549
Do. (sands)	—	734	70·74	297
Cross Your Luck (S. T. L. Synd.)	2	213	86·82	365
Enchered (Harrison & Drabble)	2	255	129·28	543
Found A. (O. W. Kelly)	2	110	63·17	265
Louise Grand (H. S. Plant)	1H	1,035	96·54	405
Do. (sands)	—	970	67·85	285
Mont d'Or (Claxton & Bussell)	2	84	100·53	422
Do. (A. Cohen), sands	—	450	34·78	146
New Brixton (J. H. Hall)	2	200	52·56	221
New Full Back (New Full Back G.M. Syndicate, Ltd.)	2	255	65·88	277
Old Loyalty (Shamva Hex G.M. Co., Ltd.)	5	460	160·90	676
Do. (sands)	—	451	44·63	187
Olympus (D. Peridis)	1H	360	96·96	407
Shamva Mines, Ltd.	56 Nis.8T	46,787	1,996·87	8,387
Do. (sands)	—	13,681	1,431·23	6,011
Do. (slimes)	—	32,005	3,347·50	14,060
Salisbury district total			8,301·54	34,866
UMTALI DISTRICT.—				
Bartissol 2 N.W. (Umtali Waterfall Syndicate)	10	677	63·45	267
Do. (sands)	—	310	19·36	81
Do. (slimes)	—	367		
Cairndhu 2W (E. K. Evans), sands	—	225	23·34	98
Champion (J. Buchanan)	5	715	108·85	457
Do. (sands)	—	435	155·15	652
Do. (slimes)	—	280		
Fairview (P. M. Branken)	5	44	23·77	97
Golden Hill (Chappell & Hall)	Pannings	—	6·93	29
Inca (F. Young)	8	294	52·64	221
Kent (E. Evans)	5	630	249·95	1,050
Do. (sands)	—	520	63·14	265
King's Daughter D.B. (Umtali Waterfall Synd.), slimes		998	54·71	230
Liverpool (R. G. Snodgrass)	5	680	94·47	397
Do. (sands)	—	286	42·45	178
Pilgrim (O. R. Cawood)	5	568	112·37	472
Quagga (Quagga Syndicate)	5	380	81·17	341
Do. (sands)	—	900	29·23	123
Queen (G. T. Hopkins)	5	70	70·40	44
Rezende Mines, Ltd.	115	19,000	1,511·53	6,413
Do. (sands)	—	3,242	339·99	1,439
Do. (slimes)	—	1,085	108·40	460
Do. (concentrates)	—	163	489·55	2,055

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Surrey (Keir & Rooke)	5	700	217·15	912
Do. (sands)	—	600	45·17	190
Umtali A. (Umtali Waterfall Syd.)	10	232	83·46	351
Do. (sands)	—	217	18·45	78
Do. (slimes)	—	271		
Umtali district total			4,005·08	16,900
VICTORIA DISTRICT—				
Empress A. (S.A. Prospecting and Concession Synd., Ltd.)	5	910	329·32	1,383
Do. (sands)	—	567	169·40	711
Do. (slimes)	—	312		
Texas (G. Scott)	10	1,300	315·85	1,327
Do. (sands)	—	750	108·72	457
Victoria district total			923·29	3.878

Mashonaland total .... 34,467·82 ozs.
Value £145,099
Total gold production .... 72,645·82 ozs.
Value £306,421

OTHER MINERALS.

		Value
Gold, ozs	72,645·82	£306,421
Silver, ozs.	10,961·72	1,053
Lead, tons	10·86	174
Chrome iron, tons	1,525·44	3,405
Diamonds, carats	105·25	376
Coal, tons	30,345·00	10,196
Total value of production......		£321 625

GOLD OUTPUT COMPARISONS.

	Ozs.	Value.
April, 1914 (previous best month)	70,336·59	£295,907
June, 1914	72,645·82	306,421
Increase	2,309·23	£10,514
June, 1914	72,645·82	£306.421
June, 1913	56,990·86	240,303
Increase	15,654·96	£66,118

THE WEEK IN THE SHAREMARKET.

Strong Front Displayed in Face of Greatest Financial Crisis of Modern Days.

THE fears of half a century came to a head this week, and the market has undergone the severest ordeal of modern times. It is unthinkable that Europe is about to plunge into the throes of a universal conflict, but only a miracle can prevent it. In the circumstances the wonder is how well prices have been maintained. Nothing but the great inherent strength of the Kaffir market, and the smallness of the bull position could have resisted such overwhelming influences. As it is, it is unlikely that prices will fall further. A panic is always worst at the beginning, and as the days go by people come to their senses again. Of course, it is sheer folly to attempt to gauge all the possible effects of a struggle at which the imagination boggles, and at this juncture it is futile to prophesy. The astonishing course of prices in the past week, shown below, speaks for itself:—

	* Fri. 24th.	* Sat. 25th.	* Mon. 27th.	* Tues 28th.	Wed. 29th.	Thur. 30th.
Adair-Ushers	0 3*	0 3*	0 3*	—	0 3*	0 3*
African Farms	11 3	10 9	10 0	9 7	8 6	9 3
Afrikanders	—	—	15 0†	—	—	—
Apex Mines	16 0*	—	15 0*	15 0*	16 0†	13 0*
Aurora Wests	8 9*	8 9*	—	--	—	—
Bantjes Cons.	—	—	12 6*	12 0*	14 0†	—
Brakpan Mines	—	—	—	43 0*	42 6*	43 6
Breyten Collieries	25 0*	25 0*	23 0*	24 0*	23 0*	23 0*
British South Africa	17 0†	—	—	—	—	—
Bushveld Tins	0 5*	0 5*	0 4*	0 4*	0 4*	0 4*
City and Subs.	47 6*	47 6*	46 0	44 6*	43 0*	44 0
City Deeps	—	61 0*	57 6*	55 0*	47 6*	53 0
Cloverfield Mines	4 6*	4 3*	4 0*	3 9*	3 6	4 0*
Clydesdales	10 0*	10 6†	—	9 0*	8 6*	9 0*
Con. Langlaagtes	31 3*	30 6*	28 0*	29 6*	—	28 0*
Con. Main Reefs	17 9*	17 6*	16 9	16 3	15 0*	16 0
Con. Mines Selections	10 0†	8 0*	7 0*	10 0†	—	—
Coronation Collieries	17 6*	—	18 0*	—	—	18 0*
Coronation Freeholds	0 3*	0 3*	0 3*	0 3*	0 2*	—
Coronation Synd.	—	—	—	3 0*	—	—
Crown Diamonds	2 6*	2 6*	2 0*	2 6*	—	2 6*
Crown Mines	—	—	—	—	105 0*	—
Durban Rood. Deeps	17 6*	—	—	—	—	—
East Rand Centrals	2 1*	2 1*	1 9*	2 0*	1 9*	1 9
East Rand Coals	1 7*	1 6*	1 6*	1 6*	1 4*	1 6*
East Rand Deeps	1 7*	1 6*	1 6*	1 6*	1 6*	1 5
East Rand Props.	34 6*	—	34 0†	31 6*	—	32 9*
Eastern Golds	1 1*	1 1*	1 0*	1 1*	1 0*	—
Frank Smiths	2 10*	2 9*	2 3*	2 6*	2 0*	2 3*
Geduld Props.	25 0*	24 0*	21 3	22 0	20 0	21 0*
Glencoe Collieries	—	—	—	—	—	6 0*
Glynn's Lydenburgs	11 0*	11 0*	—	—	—	—
Govt. Areas	24 0	23 3	20 9	21 3	18 9	20 6*
Joh. Bd. of Ex.	24 0†	24 0†	23 6†	23 6†	—	—
Jupiters	4 6*	4 3*	3 9*	4 0*	—	—
Kaalfonteins	0 3*	0 3*	0 3*	0 4*	—	0 3*
Kleinfontein Estates	20 0†	—	—	—	—	—
Klerksdorp Props.	2 3*	2 3*	2 0*	2 0*	—	2 6†
Knight Centrals	7 0*	6 10*	6 0*	6 2	6 0	6 3*

*Buyers. †Sellers.

	Fri. 24th.	Sat. 25th.	Mon. 27th.	Tues. 28th.	Wed 29th.	Thur 30th.
Lace Props.	—	3 0*	2 9	2 9	2 9*	3 0*
Langlaagte Estates	—	—	—	—	—	9 0*
Luipaardsvlei Est.	11 0*	—	—	8 9*	8 6*	9 0*
Lyd. Gold Farms	3 0*	3 2†	3 0†	2 9*	2 6*	2 6*
Main Reef Wests	8 0	7 9	7 6	6 9*	6 3*	6 0*
Meyer & Charltons	—	110 0*	117 6†	—	—	—
Middelvlei Estates	1 4*	1 4*	1 3*	1 3*	1 2*	1 2*
Modder B.'s	82 6*	81 6*	75 0*	75 0*	—	73 9*
Modder Deeps	60 6	58 0	53 6	52 3	49 0	52 0
Natal Navig. Colls.	—	—	14 0*	14 0*	—	—
National Banks	247 6*	247 6*	—	—	—	—
New Boksburgs	0 11*	0 11*	—	—	—	1 0†
New Era Cons.	5 6*	5 6*	5 0*	5 0*	4 9*	4 10*
New Geduld Deeps	2 0*	1 11	1 9*	—	1 8*	1 9
New Gochs	15 0*	15 0*	—	—	—	—
New Heriots	—	66 0*	—	66 06	—	—
New Kleinfonteins	23 6	22 0*	20 3	21 0	19 6*	20 0
New Modders	260 0*	260 0†	250 0†	—	—	222 6*
New Rietfonteins	3 0*	3 0*	3 6†	—	—	—
New Unifieds	16 6*	16 11*	—	15 0*	—	—
Orange Diamonds	1 5*	1 6*	1 5	—	1 4*	1 3*
Pigg's Peak	9 9*	—	—	—	9 0*	9 6*
Pretoria Cements	43 6*	44 6	43 0	42 6	42 9†	42 6†
Princess Estates	5 6*	5 0*	—	—	4 6*	—
Rand Klips	3 1*	3 1	2 10	2 9	2 3	2 3*
Rand Nucleus	—	1 8*	1 6*	1 6	1 4*	1 6*
Randfontein Deeps	3 6*	3 7*	3 6*	3 6*	3 6	3 6*
Randfontein Est.	—	19 6*	18 6	18 0*	17 0*	17 0*
Roberts Victors	11 0*	10 0*	—	—	—	—
Rooibergs	22 6*	22 6	20 0*	20 0*	20 0*	19 6
Ryan Nigels	3 9†	—	—	—	—	—
Shebas	4 6†	—	4 6†	4 6†	4 6†	4 6†
Simmer Deeps	—	1 7	—	—	—	0 9*
S.A. Lands	2 11*	2 9*	2 6	2 6	2 4*	2 4*
Springs Mines	13 9	13 0*	11 6	11 6	9 6*	10 3*
Sub-Nigels	10 3*	10 0*	9 0*	—	—	—
Swaziland Tins	25 0†	25 0†	—	21 3*	—	22 6†
Trans. Coal Trusts	—	—	30 0†	25 0*	25 0	25 0
Trans. G.M. Est.	—	—	—	37 6	36 0	36 3*
Tudors	—	—	2 0†	2 0†	—	—
Van Ryn Deeps	45 0*	44 0*	40 6	40 3	37 0	39 6
Village Deeps	—	37 0*	34 0*	34 3*	—	—
Village Main Reefs	32 0*	—	—	—	—	—
West Rand Cons.	7 6†	—	—	—	4 6*	—
Witbank Collieries	43 0*	43 0*	—	—	—	—
Witwatersrands	—	—	60 0*	—	56 0*	60 0†
Wit. Deeps	45 0*	46 0†	41 3*	39 0*	26 0*	34 0*
Wolhuters	14 9*	14 6	13 9	14 3	13 0*	12 6*
Zaaiplaats	24 6*	24 6	21 0*	21 0	21 0†	20 0†

*Buyers †Sellers

With reference to the reported discovery of diamonds on a farm near Aliwal North, the local paper says: We learn that six washing machines have been ordered. These cost £40 each landed here. Some people are apparently losing their heads, and there are not very many in Aliwal who would know a diamond if they saw it lying on the veld or who have the remotest idea of prospecting. Far better would it be to exercise the caution and restraint we have preached all along, and see how matters pan out at Poortje, before rushing headlong into expense.

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(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that the Sixth Ordinary General Meeting of Shareholders of the Rooiberg Minerals Development Company, Limited, will be held in the Board Room, Fourth Floor, National Bank Buildings, Simmonds Street, Johannesburg, on WEDNESDAY the 28th DAY OF OCTOBER, 1914, at the hour of Ten o'clock in the forenoon, for the following purposes, viz.:—

1.—To receive and consider the Statement of Account and the Reports of the Directors and the Auditor for the year ended 30th June, 1914.

2.—To confirm the appointment of Mr. William Julius Gau as a Director of the Company in place of Mr. G. W. Higgins, resigned.

3.—To elect two Directors in the place of Messrs. Wm. Dalrymple and [illegible], who retire, in terms of the Company's Articles of Association, but being eligible offer themselves for re-election.

4.—To appoint an Auditor for the ensuing year, and to fix the remuneration of the retiring Auditors, Messrs. Alex. Aiken & Carter.

5.—To transact all such other business as may, under the Articles of Association, be transacted at an Ordinary General Meeting.

The Transfer Books and Register of Members of the Company will be closed from the 20th day of October, 1914, to the 28th day of October, 1914, both days inclusive.

By Order of the Board,

L. S. RAYMOND,
Secretary.

Head Office:
3rd Floor, National Bank Buildings,
Simmonds Street, Johannesburg. (P.O. Box 1083.)
27th July, 1914.

New Boksburg Gold Mines, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the FOURTEENTH ORDINARY GENERAL MEETING OF SHAREHOLDERS in the above-named Company will be held in the Board-Room, Fourth Floor, National Bank Buildings, Simmonds Street, Johannesburg on Wednesday, the 9th day of September, 1914, at 11 a.m., for the following purposes, namely:—

1. To receive and consider the Statement of Account and the Reports of the Directors and the Auditors for the year ended 30th June, 1914.

2. To confirm the appointment of Mr. William Julius Gau as a Director of the Company in place of Mr. G. W. Higgins, resigned.

3. To elect two Directors in place of Messrs. Wm. Pott and Edw. H. Read, who retire in terms of the Company's Articles of Association, but, being eligible, offer themselves for re-election.

4. To appoint Auditors for the ensuing year and to fix the remuneration of the retiring Auditors, Messrs. C. L. Anderson and Company and Mr. T. R. Haddon.

5. To transact all such other business as may, under the Articles of Association, be transacted at an Ordinary General Meeting.

By Order of the Board.

L. S. RAYMOND,
Secretary.

Head Office:
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27th July, 1914

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Engineering Notes and News.

SELECTION, INSTALLATION, AND OPERATION OF TRANSFORMERS

A Brief, Practical Account of An Important Subject.

(BY A. E. H. DINHAM-PEREN.)

THESE notes are intended to cover the more important points in the selection, installation and operation of transformers used for supplying three-phase energy from a three-phase supply. The first question arises is whether a three-phase unit or three single-phase transformers grouped together should be used; the advantages and disadvantages of the three-phase unit may be briefly summarised thus: Advantages.—Lower first cost; higher efficiency; less floor space: cheaper to install: simpler outside connections; transportation charges less. Disadvantages. Greater cost of spare unit; more expensive to repair. The cost of a three-phase transformer will be about 80 per cent. of that for a group of three single-phase units having the same total capacity and designed for the same service. In general the lighter total weight and less space required by the three-phase unit will result in reduced transportation charges; but where long hauls have to be made over mountain roads or the facilities for handling heavy machinery are poor, it may be cheaper or even absolutely necessary to use single-phase transformers. When practicable, transformers should be shipped complete with the oil in their cases. This reduces transportation charges and does away with the necessity of drying out the transformers on site. Obviously a three-phase unit, having a capacity of three times the single-phase unit, will cost considerably more than the single-phase unit, but two three-phase units will cost more than four single-phase units (three transformers forming the group and one spare), and where a number of similar three-phase units are installed the cost, including for the spare three-phase unit, will be considerably cheaper than if single-phase unit groups were adopted, to say nothing of the saving in cost of buildings and floor space. While for general distribution work no hard and fast rules can be laid down regarding the proper choice, there can be very little doubt that the three-phase unit ought to be used for supplying a synchronous converter, motor-generator set or motor; and the writer believes that the three-phase transformer will be considerably more used in the future than at present. In standardizing ones transformers the engineer should select the type most suited for his future conditions. As regards the iron circuit, there is very little to choose between the different types of transformers, provided they are properly designed; but it is very desirable that these be self oil-cooled where practicable. Far too often no thought is given to the housing and running of transformers, it being assumed that they will work perfectly when poked away in any odd corner. The truth is that the ventilation of transformer houses and chambers is very important and has considerable influence in the life of the transformers. These should be roomy and the air led in through ducts in the floor, circulated round the transformers and discharged through the ventilators in or near the roof.

Take the case of a 500 K.V.A. transformer operating in a room 9ft x 10ft. x 11ft., and assuming the losses to be 2 per cent., there are 10 K.W. of energy to be radiated, which means that more than 3,000 cub. feet of air are to be circulated a minute to limit the temperature rise of the air in the room to 5 deg. C., i.e., the air in the room must be entirely renewed three times a minute. Transformers are usually rated to give 40 deg. C. rise above the surrounding air on continuous full load, but the maximum temperature under these conditions should not exceed 80 deg. C., owing to the shortened life and increased losses of the transformers at higher temperatures, so that inadequate ventilation means reduced capacity. Transformers that depend on the circulation of a cooling medium should not be allowed to run, even at no load, for any length of time without the cooling medium, as the temperature will generally become dangerously high; and it must not be forgotten that in the case of water-cooled, while the oil temperature can be kept normal by increasing the water circulation, this leads to overheating of the windings. Small transformers are seldom fitted with thermometers, but seeing how their life is affected by excessive temperature, it is very necessary that thermometers be fitted to all transformers of any importance and regular readings taken. Provision should be made in all transformer houses for easy and quick handling and examining of transformers, and all transformers should be examined periodically. All transformers should be thoroughly examined, cleaned and repaired, if necessary, and dried out before being put into service. The two methods in general use for drying out are (1) short circuit, and (2) hot air. The first method, which consists of short circuiting the low tension windings and applying sufficient voltage to the high tension windings to circulate sufficient current to keep the temperature of the windings between 80 deg. and 90 deg. C., is satisfactory for low voltage transformers, but should not be used on high voltage ones, because the insulation between the windings and between windings and iron is so

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* Paper read before the Kimberley Branch of S.A. I. of E.

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great that it is practically not effected by heat in the coils and unless very great care is taken it will be damaged by excessive current. In the case of shell type transformers, as very little heat reaches the punchings by this method, should there be any water between these it will most probably not be removed till the transformer is in service and then it will gravitate to the bottom of the tank. The transformer should be dried outside the tank, unless the hot air method is used, as it is much easier to control the temperature and prevent damage to windings. In the case of oil-cooled transformers, the oil should be dried separately. The second method, which consists of circulating air heated to a temperature not exceeding 90 deg. C. through the transformer, while in its case without oil, is the standard method for drying high voltage transformers and takes about three days to carry out, depending on the voltage size of transformer and dampness of transformer at starting. Transformer connections, with the exception of the open delta, are outside of the scope of these notes as they depend on the lay out of the system, etc., such as working with an earthed neutral. The open delta connection should only be used as a temporary arrangement, or in case of a breakdown where it is necessary to get the supply on again as soon as possible. This arrangement causes unbalancing of voltages and phase distortion, which may be serious on lighting loads. Induction and synchronous motors and synchronous converters reduce the distortion, generally speaking, but in so doing their capacity is decreased. And it must not be forgotten that the capacity of each transformer is reduced approximately 13.5 per cent.

It has generally been considered desirable to have very close regulation, except for transformers operating in conjunction with synchronous converters, which means the reactance must be low for power transformers. Under this condition very large currents, even as high as fifty times full load current, are set up in transformers on short circuit when backed up by considerable amount of power; and enormous mechanical stresses are put on the windings (due to electro-magnetic action). In fact, with certain windings it is almost impracticable to brace them to withstand injury. To reduce these stresses so that they can be properly taken care of, it has been necessary to design transformers with high reactance, which, of course, spoils the regulation, especially on low Cos ϕ. This reactance protects the switches and generators on the system against the large mechanical stresses due to excessive current, but under certain conditions it is possible that the stresses in the transformer itself may be increased instead of decreased. Oil for use in transformers must not only be free from any impurities which might injure the insulating or active material, but it must be of such a consistency that it will circulate freely and so carry the heat given off by the transformer to the radiating surfaces, it must withstand the voltage stresses and it must only sludge very slightly. This question of sludging is of great importance and well worth full investigation. There is no doubt that oxidation plays a very important part in the formation of this deposit, but it is not the whole story.

The characteristics of a good transformer oil would be as follows:—

	Grade of Oil.	
	Medium.	Light.
Flash temperature	180—190° C.	130—140° C.
Burning	205—215° C.	140—150° C.
Cold Test	-10—-15° C.	-15—-20° C.
Spec. Gravity at 13.5° C.	0.865—0.87.	0.845—0.85.
Viscosity at 40 C. (Saybolt) ..	100—110 secs.	40—50 secs.
Colour	Dark Amber.	Similar to Water.
Dielectric Strength (0.5 in. dia. balls, with 0.15 in. air gap)	30,000—35,000 volts.	30,000—35,000-volts.

It is very necessary that the oil be thoroughly dried before being put into service and maintained in this condition, while the transformer is in operation, as even the smallest amount of moisture greatly reduces its dielectric strength. In fact, 1/25 of 1 per cent. of water reduces the dielectric strength to ½ approximately. This shows how important it is that the oil should be tested periodically. The only really reliable test for moisture is the dielectric strength test, but if there are no facilities for carrying out this test, the hot wire or the $CuSO_4$ test will give fairly reliable results unless there are only traces of moisture present. Of the various methods that have been used for drying the oil, the principal ones are forcing the oil through calcium chloride, calcium oxide, or sand; forcing the oil through paper filters; forcing hot air through the oil under high temperature; and heating the oil sufficiently to vaporize. This last method is not to be recommended, as it is rather dangerous and injurious to the oil, unless a vacuum is used in conjunction with it, and at the same time does not remove foreign matter such as sediment. The blotting paper filter, which is a dryer and purifier, has proved most satisfactory and is illustrated in fig. 1, which is self explantory.

In order to secure perfect parallel operation, it is necessary that the transformers should have:—The same ratio of high tension to low tension turns; the same regulation; the same polarity. When the transformers have the same per cent. impedance (and for banking purposes the impedance must include that between the bus bars including the connections) they will each carry the same per cent. full load current, but the sum of the currents may be greater than the line current. Generally speaking, transformers differing greatly in capacity should not be operated in parallel, especially if the smaller size has much the lower impedance; and it is not advantageous to use more than one Vee group of transformers in parallel with one or more delta groups. It is harder to bank transformers having a close than a bad regulation, if there is a small difference in the ratio of high tension to low tension turns, as this small difference will cause very heavy circulating currents.

Mr. F. S. Lynch (Chairman) proposed, and Mr. John Harbottle (Member) seconded, a hearty vote of thanks to Mr. Dinham-Peren for his paper.

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FINANCE, COMMERCE & INDUSTRIES.

Government Tenders.

Speaking on the subject of Government supplies at a meeting of the Johannesburg Chamber of Commerce this week, Mr. J. Holdcroft said that the right of firms who had established themselves here to be given full opportunity of quoting for Government supplies could not be questioned on any justifiable grounds, and therefore it was a matter of disappointment that it should be necessary to be constantly calling attention to attempts on the part of some public department or another to go past South African merchants in the matter of calling for tenders. They had asked that the correspondence might be brought under the notice of the Minister.

* * * *

Building Activity.

Eight municipalities in the Transvaal Province during the month of June approved of plans having an estimated value of £83,641 10s. as against £81,217 for the month of May. Nine municipalities in the Cape Province approved plans having an estimated value of £51,928 11s. Durban Municipality passed plans having an estimated value of £19,878. Bloemfontein Municipality passed plans having an estimated value of £1,700.

* * * *

The Labour Market.

In the course of his monthly report for June the Inspector of White Labour writes:—State of the labour market in Johannesburg: The June applications for employment at the Bureau give an increase of 81, applications from employers were increased by 75, and employment was found for 79 more than in May. The improvement on the mines still continues. At the end of May 106 more white hands were employed than at the end of the previous month, but the whites employed are still 716 short of the number at work at the end of December. There are still a good number of unskilled going idle who evidently prefer to do so rather than accept the situations offered. In the more highly skilled occupations there is no difficulty in filling all requisitions from employers. In the Cape Peninsula many of the industries, which in May showed a marked decrease of activity, have again recovered, and although money is scarce and manufacturers experience some difficulty in collecting accounts for work carried out, yet a more hopeful feeling now prevails, especially in view of the large number of improvements projected by the City Council, on which it is estimated expenditure will be incurred to the extent of £110,000. The outlook in the building trade slightly improved and bills of quantities for quite a number of prospective buildings, including the Government House at Rondebosch, were circulated. There would, however, appear to be little or no actual increase in the amount of work available, there being a continued shortage of bricks and several days of inclement weather. Many bricklayers and "suitable" carpenters, therefore, remain unemployed. There was no demand of consequence for European labourers and handy-men, and only some half-dozen unskilled men were engaged for railway work.

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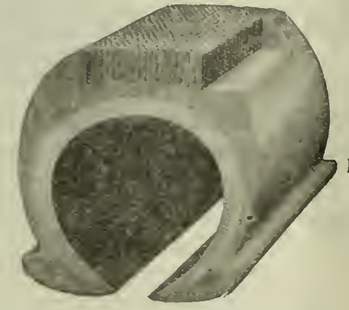

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

CONTENTS.

PAGE
Notes and News 593
Topics of the Week:
The Financial and Industrial Outlook 595
Dominions Commission and the Food Supply ... 596
War and the Industry 597
The July Output 598
The State of the Diamond Market 599
The "Safety First" Movement in the U.S.A. 600
The Dominions Royal Commission Report 601
The Economic Use of Workmen on the Rand.—III. ... 604
Rhodesian Section:
Latest Mining News 605
Correspondence and Discussion: "Economics of Citrus Growing," "Mining Reforms" 606
The July Output and Group Returns 607
Grade Costs and Profits in June 608
Mining Men and Matters 608
Engineering Notes and News:
Mine Rescue Station Rules in Great Britain.—I. 609
Finance, Commerce and Industries 611

Notes and News.

Coal Supplies and Output.

The announcement made by the Transvaal Coal Owners' Association that so long as the associated collieries in the Transvaal and Orange Free State are working under normal conditions, there is no intention on the part of the Association to raise the price of coal, has been received with general satisfaction, as common rumour has had it that a rise in the price of fuel was imminent. As a matter of fact there is no fear whatever of supplies falling short, and as the Coal Owners' Association—an institution which controls the coal supplies of the country—has announced its intention of not raising the price, the public can rest easy as to the future. There have, of course, been urgent orders for coal to be rushed to the coast, but the collieries of the Transvaal are easily capable of a much larger output than is at present being produced. It is merely a question of trucks, and in a crisis such as the present, the railway authorities, acting in conjunction with the Admiralty, have made special efforts to expedite ocean bound supplies. The same remarks apply to the Natal coal fields. A Natal colliery owner has offered his whole output to the Admiralty, but was informed that the Admiralty had ample supplies from their own contractors. It is understood that in view of the position in connection with the coal trade some of the colliery owners desire that the Government should take over the whole coal supply. Instructions have been received by the Mafeking railway officials to collect all trucks and send them forward to the coal mines for the transport of coal. The first train of seventy-five trucks left on Tuesday afternoon for the Transvaal coal mines, via Fourteen Streams. It may be pointed out that the coal output of the Union in June was 728,101 tons, and in May 774,457 tons.

* * * *

De Beers Closing Down.

Owing to the financial collapse in London caused by the war, the De Beers Company find themselves unable to continue working for the time being. In an official notice issued yesterday, it is stated that the Diamond Syndicate, finding it impossible to dispose of diamonds at the present time, have terminated their contract with the De Beers Company, and under these circumstances it is an absolute impossibility that the working of the mines can continue to be carried on. We understand that the heads of departments were called together yesterday afternoon and informed of the situation by the general manager, and that arrangements are being made to close down all operations in the course of the next few days, except such as may be necessary for keeping the mines free of water and other protective measures. As regards the natives, arrangements have been made for their immediate repatriation direct to their homes. It is hoped that the closing down of the mines will be of short duration, but naturally this must depend upon the prolongation, or otherwise, of the war in Europe. We understand that the company intend to make arrangements for the rationing of all white employees thrown out of work until such time as mining operations can be resumed. Although, of course, the closing down is a most unfortunate and regrettable necessity, it must be recognised that even assuming that money were available for the purpose, it would not be in the interests of the diamond industry, or in the permanent interests of Kimberley, that huge stocks of diamonds should be accumulated during a period when sales are totally suspended. As a matter of fact, however, the present financial conditions in Europe are such that there is absolutely no alternative to the course which the company have very reluctantly been compelled to adopt.

* * * *

The Government Areas Plant.

Excellent progress continues to be made at the Government Gold Mining Areas property on Modderfontein. The battery house is up and stamps are being installed. The tube mills are all in place, and very good progress has been made in regard to the Butters' filter portion of the plant. As to cyanide tanks, these are practically all in position. In short, the whole fine equipment is in an advanced state of construction, and will very shortly be ready for regular work.

* * * *

Vryheid (Natal) Railway Coal and Iron.

The report of the Vryheid (Natal) Railway Coal and Iron Company, Ltd., laid before the meeting on the 23rd ult., covers the year ended 31st January, 1914, and states that at a meeting of the debenture holders held on 10th December, 1913, it was resolved to renew the existing £75,000 first mortgage debenture stock and to authorise the issue of new £25,000 stock ranking pari passu with the old. After allowing for depreciation and providing for interest on debenture stock and loan, the result of the year's trading shows a profit of £7,887, from which has to be deducted the debit balance of £3,451 from last year's accounts, leaving £4,435, which the directors recommend shall be carried forward. The Board decided, on legal advice, to constitute the amount received on the forfeited preference shares a capital reserve, and to write off against the same certain items of expenditure—brokerage, commission and discount and expenses of debenture issues appearing in last year's balance sheet, together with expenditure of a similar nature incurred during the current year, including discount on £25,000 first mortgage debenture stock on 1st May, 1914, and leaving a balance of £15,197 available for similar purposes in the future if required. Through traffic to the Pietretief extension is now running over the company's railway. During the year the shortage in native labour was acute, and in consequence the greatest difficulty was experienced in meeting railway and other contracts. Certain new arrangements have since resulted in a large influx of labour to the mine, and the directors have every reason to believe that the more permanent conditions under which the labour has been engaged will result in the necessary increase in output, on which hinges the prosperity of the company. The superior quality of the coal continues to give complete satisfaction.

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I.M.M. Post-Graduate Courses.

Applications for post-graduate courses in various parts of the world, under the auspices of the Institution of Mining and Metallurgy, should be sent to the Secretary not later than September 1st next. The courses are confined to selected Graduates of the Royal School of Mines and other Colleges (who, if they are not already students of the institution, must apply for admission immediately after their selection), who have obtained diplomas or degrees after taking a specialised course of not less than three years in mining or metallurgy and the allied sciences. Applications must be endorsed by the Professors of Mining or Metallurgy under whom candidates have been trained, and full particulars of their age, general education and training must be given. Selected candidates are required to pass a medical examination on behalf of the Institution. The courses commence about the middle of December, and those selected are expected to sail in November. Graduates pay their own passage to the mines to which they are appointed, but receive from the mine owners remuneration which varies in amount in different districts, but which in all cases is sufficient to cover the cost of living. The course is in most cases for one year and during that time graduates are rotated through the various departments of the mine or works to which they are sent, at the discretion of the manager.

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The Formosa Co.

At the property of the Formosa Gold Mining and Developing Company in the Lydenburg district, gold recovery operations have been in progress for the past six weeks and about 80 odd ozs. have been recovered principally through the medium of pestle and mortar. At the same time, work is proceeding in connection with the erection of a 2-stamp battery, and sluice boxes are being installed. Progress is also being made on development of a flat reef. The prospects generally are reported to be good. The first statutory meeting of the shareholders was held at noon on Tuesday last, in the company's offices, Exploration Buildings, Johannesburg. Mr. H. de V. Steytler presided, and Mr. Richard Goldmann, who also is a director of the concern, was present, with some eight or ten other shareholders, or their representatives. The chairman explained that the business was mainly of a formal nature, and invited Mr. Goldmann to report the results of his recent inspection of the property. Mr. Goldmann thereupon gave an interesting description of his visit to the property, in company with the chairman, and, in doing so, expressed their approval of the prospecting and developing work already done there, and also of the progress made in the erection of the plant, with which crushing operations will shortly be commenced. Mr. Goldmann expressed his complete satisfaction with everything he saw, and spoke confidently of the value of the flat reef and leaders located, apart altogether from the rich alluvial deposits on the property.

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Rhodesian Features.

A batch of Rhodesian annual company reports will be found in this issue. Reference is also made to the Tanganyika report. The Benguella railway has made great progress, and is now 502 kilo. from Lobito Bay. Traffic on all the railways in which the company is interested is increasing. From the commencement of mining operations 15,000 tons of copper have been produced by the Union Minière Co., which realised £160,000. Zambesia Exploring continues to advance money to Tanganyika at 6 per cent., with certain collateral advantages attached. The Eldorado Banket position is not so encouraging as before. The Parallel reef has ceased to be payable, and the Main Reef is the company's sole stand-by. The tonnage has been greatly reduced, and profits are down by one-half; but there are good developments in levels Nos. 11 and 12, where the ore is of high value. The ore reserves are now 47,950 tons, of the satisfactory value of 13·7 dwts. Two dividends of 15 per cent. each have been paid, and 10 per cent. will be received by the shareholders on July 29. Lomah (Rhodesia) Co.'s Kambanje mine is showing encouraging developments in the lower levels. The Main reef, where cut, gave 15 dwts. gold over 18in. on the west side, and 14 dwts. over 28in. on the east side. Shamva profit for June was £10,856. The Falcon mill continues to give satisfaction. The grade of the ore is good, but a regular run is not, at present, expected, though a return is foreshadowed for August. The directors of Wanderer (Selukwe) are returning 2s. per share to the shareholders, or £60,000 in all. The board have found no suitable property in which to invest the company's funds.

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The Falcon.

The Falcon Company, owning a large gold-copper mine in the Blinkwater district of Northern Rhodesia, has now been productive for some considerable time, and from official messages it is clear that the equipment, which is quite novel in so far as South Africa is concerned, is working satisfactorily. The grade of ore from the mill continues to be fully up to what is called for from the original stope plans. It is not expected to be able to run the plant regularly until the accumulated concentrates are sintered, and sufficient sintered products are on hand to ensure continuous running of the blast furnaces.

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"Tanks."

The report of the Tanganyika Concessions shows that the company's only income was barely £1,920, derived from transfer and other fees, whereas management expenses, depreciation, and debenture interest absorbed £178,160. Consequently there was a debit balance for the period of over £176,000—following upon the debit of £136,116 for the preceding year—which has been written off premium on shares account. The directors point out that the actual smelting operations of the Union Minière du Haut Katanga, which is working the Congo copper deposits, resulted last year in a sum to its credit of £160,000, and they add that the extension of that company's furnaces will largely increase its earning capacity, "and should enable that company to make a substantial distribution to its shareholders." Then "the finances of your company (the Tanganyika) will be placed on a sounder basis." Meanwhile the Tanganyika is to be further financed by the Zambesia Exploring Company. The advances made by the latter company entitle it to interest at the rate of 6 per cent. per annum and a 10 per cent. interest at cost in all tin prospects belonging to the Tanganyika, with the option of taking 25 per cent. in any new business undertaken by the Tanganyika on the same terms for a period of five years. On the tin areas that have been pegged prospecting has been carried on during the past year, but, it is stated, without definite results so far. On the diamond areas—in which the Zambesia Exploring Company is interested to the extent of one-half of the profits—work is stated to be proceeding steadily. So far, however, no great find appears to have been made, the largest of the stones produced last year weighing no more than three carats.

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Pomona Diamonds.

The third annual report of the directors of the Pomona Diamonds, Ltd., says the output for the year ended May 31 was 127,153·684 grammes, equal to 635,768 metrical carats. According to advices received by the directors, royalty had not been received at the date of closing the accounts on 68,660·635 grammes, *i.e.*, 318,303 carats. The average selling price during the year 1913 was 52·85 marks (old carat measurement), as against 42·21 marks in the previous year, the increase in price being due chiefly to the increased weight of the stones, the average being 2 4-5 stones to the carat as against 3½ in the previous year. The biggest stone found hitherto weighed 22¼ carats. The royalties received during the year amounted to £21,591 12s. 5d., leaving, after deduction of outgoings, a balance of £21,308 14s. 10d., out of which the directors have declared and paid dividends amounting to 117½ per cent. on the issued capital of the company, namely 8¾ per cent. on June 14, 1913; 10 per cent. on July 14, 1913; 42½ per cent. on October 14, 1913; 32½ per cent. on January 15, 1914; 23¾ per cent. on May 14, 1914.

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Health and Safety of Workers in Home Mines.

The British Royal Commission appointed to inquire into metalliferous mines and quarries, in their second report, recommend that the provisions applying the Factory Act to the pit banks of metalliferous mines and quarries be repealed, and that specific provisions dealing with the question of hours of employment of women, young persons, and children, the fencing of machinery, the provision of conveniences, the prevention of dust, and other matters now regulated by the Factory Act should be inserted in a new Statute. It is proposed that the new Act should be made to apply to all quarries in which persons are employed, with power to the Secretary of State to exempt such classes of quarries as it appears unnecessary to inspect, and in the case of quarries which are owned by or under the control of local or public authorities, to designate the persons who shall be responsible for the safety of the quarry. It is recommended also that the duty of enforcing the provisions in regard to the fencing of the shafts of abandoned metalliferous mines should be wholly transferred to the local authority. The question of further additions to the staff of sub-inspectors of quarries is left to be settled by the Home Office. Provision, it is declared, should be made in the new Statute for examination of mines and quarries by representatives of the men, who should also have facilities for inspecting any place where an accident has occurred. In dealing with supervision and management, the Commission recommend that every mine employing more than 12 persons underground, and every quarry employing more than 25 persons inside, should be under the control of a manager, who is not less than 25 years of age and with not less than five years' practical experience, and who must possess a qualifying certificate. Power should be given to the Secretary of State to make general regulations dealing with the use of explosives in metalliferous mines and quarries.

TOPICS OF THE WEEK.

THE FINANCIAL AND INDUSTRIAL OUTLOOK.

The outlook has changed with dramatic rapidity since the last issue of this paper. For reasons set out very fully, on Monday, in the House of Commons by Sir Edward Grey, Great Britain has declared war on Germany, and the whole Continent of Europe is now in the throes of the greatest conflict of modern times. Since, in Lord Milner's famous phrase, the best South African is also the truest Imperialist, it behoves us in this country to concern ourselves, first of all, with setting our house in order; and thereby securing the safety of the Empire as a whole. How far the great ocean trade routes of the Empire will be menaced, it is impossible to say at this juncture, but there is every reason to suppose that even if they are closed to merchant shipping, this country and the mining industry, which is still its chief mainstay, can "carry on" with present supplies and local production. That, at least, seems to be the general belief of all connected with the administration of the industry, from the President of the Chamber of Mines downwards, and the views advanced on the subject in our columns last week have been fully endorsed and confirmed by further inquiry. Working costs, of course, cannot entirely escape the effect of the dislocation of European business, but in no case is the increase likely to be great enough to eat up the profits of even the very low-grade producers. The importance of continuing the industry upon its present basis of production is obvious, because of (1) its part in maintaining the revenues of the State, and (2) the increasing need of gold. For these reasons, every effort will doubtless be made to keep the industry working on normal lines. Thus, it is believed that the United States can and will supply all the cyanide requirements of the industry, when the present stock of that requisite gives out. The Barnato Group, it is understood, now obtain all their cyanide supplies from England. Of detonators, there is know to be an ample supply available, and in regard to fuses, the Australian works of Messrs. Bickford, Smith and Co., can always be drawn upon. As far as can be humanly seen, therefore, there is no reason why the industry of the Rand should be restricted by the war. The usual processes of finance and commerce, however, can hardly hope for the same good fortune. In London, since last we wrote, the Bank rate has been put up to 10 per cent. and lowered again to 6 per cent. The Bank Act has been suspended, the Stock Exchange closed, and a *moratorium* declared in respect of certain bills of exchange. No business man needs to be told that a 10 per cent. Bank rate was the direct outcome of the heavy withdrawals of gold from the Bank of England of late, that it was the most effective means of conserving the gold reserve aginst further encroachments, and that it was no more and no less than the obvious financial requirements of the situation demanded. The suspension of the Bank Act of 1844—which requires the Bank to deposit gold in its vaults for every issue of notes beyond a certain fixed figure—is likewise a statesmanlike step, designed to reassure public opinion, and lend the security of a State guaranteed issue to the notes of the Bank of England. The *moratorium* declared will doubtless be extended to meet the reasonable needs of business, dependent upon the duration and severity of the upheaval caused by the war, and the degree of the restriction placed upon the ordinary operations of commerce. In the Transvaal, it will be remembered, a *moratorium* existed during the war of 1900-2, and its validity was upheld in the Courts. In connection with finance, the action of the groups in withholding the payment of the June dividends, and thereby conserving cash resources against a period of uncertainty, not to say possible financial choas, is, of course, to be commended. All these speculations are naturally conditioned by the turn affairs will take. For attempting intelligent anticipations, there are no precedents to guide us, and we must trust the strong men of the Imperial and Union Governments to make the history of the coming struggle worthy of the high traditions of the Empire and

South Africa. Meanwhile it is to be hoped that the troubles foreshadowed by the Administrator in his speech in the Provincial Council on Thursday may not all materialize. To quote the daily papers:—

> The Administrator said it was clear people had no idea of the gravity of the situation. No man could say how long the present state of things would last. There was no doubt the diamond mines would have to close down, and that would affect the Union at once. The gold mines would go on working a certain time, perhaps the whole time, but there would be no profits and no profit tax. In a state of war there would be no importations, and the railway revenue would be affected. There was then the question of public works, to carry on which they relied on loan funds. There would be no fresh loan funds forthcoming. It would be impossible to get the necessary money in Europe. There was no money to go in for fresh expenditure, and they did not know when they might get it. He was not painting an alarming picture, but they should know the position. It was ridiculous to talk about hoarding money. They had to prepare themselves for the serious position in which they were placed. There was a large number of unemployed; in the near future there may be more, owing to the tin and diamond mines having to close down. There was no question of exporting produce; there would be no sale for ostrich feathers, and it would be only with the greatest care they could pay their way. That was why it was so necessary they should know where they were, and not go in for fresh expenditure.

The Union Government will doubtless institute the necessary measures of Martial Law, which will effectually prevent the exploitation of the poor. How far the man power of the Empire will have to be drawn upon remains to be seen. Short of actual participation in the struggle, however, every citizen can best serve his country by continuing to fulfil his allotted task, however humble or obscure it may be, in the noble and inspiriting words of His Majesty, "calm, resolute, trusting in God."

DOMINIONS COMMISSION AND THE FOOD SUPPLY.

In view of the war, and its possible effects, it is noteworthy that the South African report of the Dominions Royal Commission, to which we make extended reference elsewhere, states that in respect of food supplies South Africa imports an unusually large proportion. Her total imports of articles of food and drink rose from £5,552,000 in 1909 to £7,584,000 in 1913. The exceptionally large increase in 1913 was partially due, in the opinion of the Commission, to a succession of poor crops, the result of long-continued drought. But "even in normal years South Africa buys from abroad large quantities of foreign produce which it would seem could profitably be raised within the Union." The Commission makes due allowance for the obstacles which have hindered agricultural development, such as insufficient rainfall in many places and the prevalence of pests and animal diseases. "These hindrances are being energetically met and steadily conquered." The most pressing need, however, is the scientific conservation of water. "The introduction of White immigrants and their settlement on the land would undoubtedly contribute to increased agricultural development, but the Commission is of opinion that South Africa "presents no such openings for the introduction of White settlers as do other Dominions." Immigrants going into the United States, Canada, Australia, and New Zealand "have consisted for the most part of men willing and able to work with their hands, who, in those countries, can command a living wage by manual labour. Experience elsewhere, and notably in the Southern States of the American Union, goes to show that this class will not emigrate into a country in which they will have to compete with low-priced Black labour long since accustomed to do the work of the country. . . . It is generally agreed that farmers, to succeed in South Africa, require to start with a capital of not less than £1,000 (many say £2,000). . . . The direction in which there appears to be the best hope of progress in immigration is in connection with irrigated land. If considerable tracts now dry and barren can be made available for closer settlement and intensive culture, then there may be created openings for the skill and energies of the White agriculturist. Similarly, if tsetse fly can be stamped out, if the present system of large estates is modified by the Government and suitable large holdings are broken up into closer settlements, and if railway facilities are provided for the easy marketing of produce, opportunities will occur for new White settlers." The Commission adds that "in no country in the world is agriculture so popular, and, if we may say so, so fashionable; in none does it receive the attention of so large a proportion of the best brains of the community. The financier, weary of dull markets, turns to agriculture for solace, and both financial magnates and distinguished politicians are placing their sons upon the land." A point ignored by the Commission, to which attention may now usefully be directed, is that of countries of origin in the case of oversea supplies, as we are reminded by the remark of a trader who refers to the large proportion of his supplies carried under the American flag. Our imports of flour and wheaten meal from the United States in 1912 amounted to 2,835,814 lbs. We imported 44,761,684 lbs. from Canada, and 62,964,684 lbs. from Australia. Of wheat itself we imported 6,830,119 lbs. from Canada, 60,821 lbs. from India, 105,233,566 lbs. from Australia, and 1,002,010 lbs. from the United States. America also sent us, among other food commodities, 69,280 lbs. of oatmeal, 1,033,428 lbs. of preserved fish, 552,946 lbs. of cornflour, 96,667 lbs. of biscuits, and so on. Altogether, we import very largely from other than European sources. The agricultural statistics of the country as a whole go to show that despite such periodical drawbacks as are due to drought, there is a steadily increasing production of food stuffs within the Union, and among the rest the quantity of wheat produced increased, between 1908 and 1911, by nearly 60 per cent., suggesting that we are within sight of the point when we shall produce sufficient for home consumption.

Diamond Convention.

The London Mining Journal in mail week said:—The announcement was made this week that the conference of diamond producers convoked at the instance of the South African Government has arrived at an agreement to restrict output. Beyond the bare fact that an agreement has been reached, little or no information is available, and the conditions under which a curtailment will be enforced and the quotas assigned to the different producers have not been stated. While, of course, negotiations have been spoken of for a considerable time between the South African interests and the German producers, it is probable that it is a cessation of the American demand which has finally produced an understanding. Purchases in the United States this year are reported to show a heavy decline, partly in consequence of the new tariff and partly to general trade conditions; while Mexico, Brazil and the Argentine, important avenues of distribution, are naturally not buying.

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New African.

In order that their annual statement might more conveniently reflect the results of the undertakings in which the New African Company is interested, the Directors, when presenting the report for 1912-13, proposed that future accounts should be made up to the 31st December instead of 30th June. This proposal received the approval of the shareholders in meeting assembled; the promise was made that an interim statement would be issued and the hope expressed that it would contain the announcement of a dividend. Accordingly an interim report covering the twelve months to 30th June has been sent out—with great promptitude, by the way. It shows a profit of £22,600, as against a loss of £2,400 for the preceding period for which the income amounted to barely £7,000. Reference is made to the improved profits of the Taquah Exploration, and the increased coal output of the Welgedacht Exploration Company. In connection with the Rooiberg Minerals, whose dividends, of course, have fallen off seriously, the opinion is expressed with regard to tin that "a continuance for any time of the present low prices is likely to work its own cure, as many mines which cannot pay at present values will cease producing."

WAR AND THE INDUSTRY.

A Further Examination of Resources—Questions of Currency and Payment of Dividends—The Coal Trade.

Since our last issue went to press events in Europe have moved rapidly and dramatically, and with Great Britain herself now involved in the greatest struggle the world has ever witnessed, we make no apology for returning to the subject of the war and its possible and probable effects on the gold industry and other mining industries of South Africa. At the present juncture one is, in fact, incapable of thinking or writing save in terms of war and the directions in which war impinges or may impinge on the national and industrial fortunes of the Empire and the Union. Last week we wrote of the financial outlook, the resources of South Africa, particularly in regard to food supplies, and the commodities the mines import from overseas, such as explosives, steel, cyanide, and zinc. We also touched on the importance of the Main Reef series as a factor in the martial preparations of the armed camp in Europe, by reason of the enormous production of gold which is the basis of the world's barter, and thus provides the sinews of war. Briefly stated, the conclusion arrived at in regard to commodities of the mines which are imported from overseas was that the outlook for a maintenance of operations is, on this score at any rate, a favourable one. In regard to explosives, we stated that we understood large supplies of the raw materials employed in the manufacture of explosives were carried locally. As to steel, it was pointed out that stocks in the country or about to arrive would suffice for some very considerable period, whilst the question of manufacturing steel in South Africa, at Vereeniging, for instance, was touched on. And in regard to cyanide, it was remarked that the usual practice of the mines is to hold about two months' supply in hand, and as there is generally two months' supply on the water it is assumed that no difficulty should be experienced for three or four months. Mercury, it was shown, is not a highly essential commodity in the present metallurgical practice of the Witwatersrand. And as to zinc, we reported that substantial supplies were on hand, that there were distinct possibilities of producing zinc in South Africa, and, moreover, that the high road of the seas to Australia, a large zinc-producing country, would in all probability be maintained under any circumstances.

The Industry Well Provisioned.

Since the whole of Europe is at war, the subject of our own supplies for the ordered working of the industry may well be returned to, especially so in view of the fact that since our last issue went to press one or two important and new facts have come to light. The Chamber of Mines, in conjunction with the various mining groups, has been busily engaged during the last few days on a stock-taking of the supplies of the mines such as those mentioned above and in regard to coal and all other requirements. Some mines are, of course, much better circumstanced in regard to requirements than others. For instance, enquiries have elicited the information that at least one mine is in possession of sufficient cyanide to last for at least six months. But other mines are not, of course, so well circumstanced. However, the evidence on the whole appears to be that the mines are pretty well supplied in this respect, whilst in regard to explosives the outlook is satisfactory. It is understood that the De Beers Explosives Company at Somerset Strand and the British South Africa Explosives Company at Modderfontein have between them sufficient raw materials to supply the industry for practically twelve months. Other necessary supplies, such as steel and cyanide, are reported to be on hand in considerable quantities. As to mercury, a report has been current that a firm or firms hold practically all the supplies in the country, and that the price has been sharply advanced. The Government, it is understood, will sternly repress any such measures as conduce towards the "cornering" of any essential requirements of the industry.

Payment of Wages.

Now as to currency. The working of the Rand requires the payment of very large sums of money in salaries to both whites and blacks. We are given to understand from authoritative sources that a scheme whereby natives will be paid in gold, whilst whites will be paid in Government notes, has been considered, and it may have by this time advanced almost to the point of materialisation if and when necessary. In the event of it being deemed inadvisable to despatch the gold shipments to Europe, the production of the mines will doubtless be stored in South Africa under strong Government guards, and notes of perhaps £1 and 10s. value will be issued against the security of the State and the secured gold. It is argued that it would be impracticable, or at any rate inadvisable, to pay natives in notes of exchange, as they probably would not accept the change of currency without uneasy doubts and misgivings. This seems to be a perfectly feasible and understandable plan, and would no doubt act satisfactorily. Another interesting point that has been to some degree discussed during the past week is in regard to the payment of dividends by Rand gold mining companies. It is usual to send out the dividend warrants in August, and it has been suggested that in the circumstances which have arisen in the last few days it may be deemed advisable to revoke the declarations, or at least to defer the payments. It is, of course, well known that the payment of the Rand mining companies' dividends involves the transfer of a very considerable sum of money to a country with which Great Britain is now at war. So far as can be ascertained, however, the opinion is held in some financial circles that the payment of the dividends should on no account be delayed, and that to do so would seriously injure the reputation which the Rand deservedly enjoys for the regular returns which the oversea investor receives as his share.

The Coal, Diamond, and Base Metal Industries.

As to coal, South Africa is, as was pointed out in our last week's issue, in a particularly fortunate position. Rumours have been current that the price of coal is to be advanced. This, we are informed, is not the case. There is, at present at any rate, no intention whatsoever to increase the price of coal. Elsewhere in this issue appears an authoritative announcement from the Transvaal Coal Owners' Association on this point. Doubtless these rumours have originated from the reports which appear to be thoroughly authenticated of hurried coaling on the part of the Admiralty at the coast ports. Considered on the whole, the industrial outlook in the Sub-Continent is thoroughly satisfactory. There has, of course, been enormous depreciation in the value of securities, and it is not to be expected that the prices of products such as base metals and diamonds will be below the lowest prices of recent months for a long time to come. Of the effects of the great crisis on the diamond industry we have something to say elsewhere in this issue. Tin and copper prices have naturally fallen heavily, but the metal markets are closed, and what the extent of the depreciation has been no one can say. It is probable, however, that there will be a considerable curtailment of output of tin and copper in this country, and it is more than probable that the mines will cease productive operations altogether. But as to gold and coal, there can be no doubt that the present conflict of the nations will stimulate demand for these very essential articles, which are as essential to the world's war as they are to the world's peaceful evolution of commerce and industry.

THE JULY OUTPUT.

Improved Profits—The Native Labour Situation.

The returns of Rand gold mines to hand up to the time of going to press are eminently satisfactory, and although at a time like the present the achievements of the mines are likely to be in a large degree lost sight of, whilst investors must naturally feel depressed at the enormous depreciation in the value of securities, there can be no doubt that never was the gold mining industry in a more sound position than at present. As we showed in our last issue—and we return to the subject this week—the outlook for maintaining operations along the Reef at the present scale of production and profit-earning is very good, and there is the virtual assurance that supplies on hand or about to arrive will be sufficient for several months to come. And should the position in Europe be such as to cut off South Africa from the world's big trade centres after present stores have been exhausted, there can be no doubt that South Africa could face the emergency in a number of ways, and by resorting to expedients such as the storage of tailings for future treatment and the manufacture of material in the country such as zinc and steel, could continue to operate the mines on a satisfactory running basis for a longer period than is perhaps generally reckoned on.

Diamond Mines and Native Labour.

The position in regard to native labour is particularly interesting at this juncture in view of the decision of the boards of directors of some diamond mining companies to restrict operations, and, in fact, in the cases of some companies, to suspend operations altogether. The statistics published by the Government Department of Mines for the month of June show that the diamond mines of the Union, exclusive of individual diamond diggers and their natives, employed 41,113 natives, the distribution being as follows: Transvaal, 14,209; Cape, 17,698; Orange Free State, 9,206. There can be no doubt whatever that the diamond market has a period of acute depression before it. The fact that gem stones are likely to be a glut on the market for a considerable time to come has to be faced, and very naturally a very substantial curtailment of productive operations has to be decided on. In these circumstances a very considerable number of whites and natives will be thrown out of employment. In point of fact, large numbers have already been paid off at Kimberley, Jagersfontein, the Frank Smith and other mines, and it is now announced that there is no alternative to the closing down of the De Beers mines. This, of course, is a most regrettable matter, but some measure of consolation is to be obtained from the fact that numbers of natives so discharged will be absorbed by the Rand. This would naturally result in an increase in the white labour force as well. The native labour forces of the gold mines of the Union are still a good way below the strength of the early part of last year, and there can be no manner of doubt that the industry of the Rand could easily absorb the discharged natives of the diamond fields.

The July Returns.

The July output statistics which have come to hand to date are, as already stated, very satisfactory. The East Rand Proprietary Company's profit at £82,231 is the largest recorded by that company since October of last year. The following are the results of last month's operations:—800 stamps milled 172,500 tons; 57,335 ozs. fine gold recovered, valued at £211,100, including 1,805 ozs. valued at £7,592 recovered from the treatment of the accumulated slime; profit for the month, £82,231, including £6,168 profit from the treatment of the accumulated slime. Recent monthly profits have been:—

	1913.	1914.
January	£95,698	£50,015
February	89,514	50,292
March	95,010	60,512
April	95,204	63,983
May	95,014	69,941
June	92,007	73,891
July	47,126	82,231
August	82,513	
September	83,460	
October	83,504	
November	79,252	
December	75,010	

As to the New Kleinfontein, the operations on this company's property for the month of July were: Stamps, 200; days run, 29·359; tube mills, 4; tons milled, 52,350; gold recovered (fine ozs.), 15,997·804; net value, £67,226 6s. 7d.; profit, £23,016 11s. 9d.; working costs (excluding development), 15s. 6·101d.; development to working costs, 1s. 4·580d.; total working costs, 16s. 10·681d.; capital expenditure, £923 14s. 10d.; maintenance expenditure upon Apex and Benoni sections, £820 15s. 5d. The Albu group records a profit of £68,194 as compared with £67,636 in June. The New Goch's profit at £11,138 compares with £10,689 in June. The West Rand Consolidated's profit is £6,935, as compared with £5,693 in June. Complete returns are:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,822	£13,999
Meyer and Charlton ...	75	15,073	13,091
New Goch	120	30,700	21,715
Roodepoort United	70	31,368	27,530
Van Ryn	140	39,800	29,155
West Rand Consolidated ..	100	26,500	26,381
	585	£158,263	£131,871

The Brakpan Mines Company declares a profit of £28,011, or 9s. 9d. per ton, as compared with £25,690, or 9s. 6d. per ton, in the preceding month. Working costs have been reduced by 5d. to 17s. 6d. per ton. The ore milled was 57,280 tons, as compared with 54,150 tons in June.

Barnato Mines.

The subsidiaries of the Johannesburg Consolidated Investment Company record a further increase in profit—£118,601 for July, as compared with £115,230 in June and £110,139 in May. The returns of the Consolidated Langlaagte and Van Ryn Deep are particularly noteworthy. Working expenses at the latter mine were reduced to just over 15s. per ton.

New Vaal River Diamonds.

During July, 380 diggers on the estate of the New Vaal River Diamond and Exploration Co., Ltd., produced 3,014½ carats of diamonds, which realised £15,002 5s.

Diamonds at Aliwal.

The Town Council of Aliwal North have decided to throw open the town commonage for diamond prospecting from last Monday. The farm Poortje is to be thrown open on August 5, and the area for prospecting has been increased.

THE STATE OF THE DIAMOND MARKET.

Will the Conference Agreement be Binding?—Position in Amsterdam—Trade Slump.

In view of the closing down of so many diamond mines owing to the European war, some notes on the position of the diamond trade may be opportune. A Hatton Garden correspondent writes:—"The principle of creating a central selling office for the principal diamond producers, as adopted by the Conference, seems to find much favour, particularly among the big manufacturers on the Continent. They are of opinion that some scheme or other was inevitable in order to regulate the output according to the demand, and they believe that hardly a better solution than the one mentioned could have been found, as it will be beneficial alike to the producer and to the manufacturer. Although the supply may at times necessarily be curtailed, the producer will reap the benefit by having prices maintained, and this will be felt through the whole business. I understand that as some considerable time will be required to arrange details, the new arrangement will not take effect until the new year—that is to say, as far as the selling agency is concerned. The regulating of the output will, I believe, come into force almost at once."

A Consular Opinion.

The British Acting-Consul at Amsterdam states that the year 1913 was a most unfavourable one for the diamond trade and industry, and unemployment has not been so general for many years. The run of "malaise" in this most sensitive industry began as early as the end of 1911, and has continued and increased until the end of 1913, when it is hoped that it has reached its worst point. The cause of this affection may be traced in the main to the Balkan war and other disturbances in South-Eastern Europe, and the consequent moratorium in various belligerent States, which were of considerable influence on the European money market. The money market reacted directly on the purchasing power of the European public, and the moratorium brought the trade itself into difficulties. Following upon this the United States of America raised its customs tariff, and uncut diamonds which were formerly free are now liable to 10 per cent. duty ad valorem, and cut diamonds from 10 per cent. are raised to 20 per cent. Buyers in the States ordered large quantities freely before the new duty came into force, so that practically no orders have come from America. Another cause, which is even more serious and perhaps of a more permanent nature than those above mentioned, is the practically unlimited supply placed on the market of German West African diamonds, which was aggravated by the methods at first employed. The present situation is most critical on account of the contract made by the German Regie with a consortium at Antwerp that the latter should accept during 1913 1,000,000 carats. The market during 1913 could not possibly absorb such a quantity, so that the evils of over-production are being felt.

Effects on Labour.

The diamond industry at Amsterdam at favourable seasons gives employment to about 11,000 skilled workpeople, of whom about 1,600 are females. The industry is highly organised, as out of this number there are only 150 hands who do not belong to any union. There are four unions, the largest being the Algemeen Nederlandsch Diamantbewerkers' Bond (General Netherlands Diamond Workers' Union), with a membership of 10,000, while the remaining three have about 850 members between them. All persons engaged in the diamond industry, however, whether organised or not, comply with the regulations of the largest union, so that the minor unions are only separated from the larger one on religious grounds. The following figures show the extent of unemployment during 1913 as compared with the previous year:—January, averages per week in 1912 1,308, in 1913 2,925; February, 1912 1,070, 1913 1,759; March, 1,640, against 1,397; April, 2,107, against 1,742; May, 1,162, against 2,141; June, 1,170, against 1,955; July, 1,080, against 1,779; August, 1,198, against 2,181; September, 907, against 2,455; October, 880, against 2,494; November, 2,190, against 3,376; December, 3,370, against 4,151. It is noteworthy that the metric carat (200 milligrams) has now been made the legal weight for precious stones in the Netherlands. Although the law had been promulgated some time ago it was not immediately put into force, at the request of the Jewellers' Association at Amsterdam, so that the law would operate simultaneously in Belgium and the Netherlands.

The Native Point of View.

The report of the proceedings of the Transkeian General Council at the session of 1914 has been published. We have recently had occasion to discuss Mr. Buckle's Report on native grievances on the mines of the Witwatersrand. One of his suggestions is the prohibition of credit between Europeans and natives. He also recommends the gradual abolition of advances and the substitution of deferred pay, coupled with the abolition of the capitation fee paid to recruiters. All these matters were discussed at the last session of the Transkeian General Council. Chief Mamba, for instance, in moving for a Select Committee to consider the labour question, began by reminding the Council that the question could not be fairly discussed unless they recognised that the interests of the traders, the mine-owners, and the shareholders were involved as well as the interests of the native labourers: "As considerate people," said Chief Mamba, "they could not demand that the scale of wages should always have an upward movement. Indeed, much as they would like to see every boy get an increase, they had to pause and consider the matter from the point of view of the mines. Was it not a fact that even now certain of the mines returned no dividends? How, then, could these mines grant an increase in wages? These mines were good in offering employment, and the employed must show them every consideration." Chief Mamba also protested against the continuance of the colour-bar on the mines. Mamba is justly proud of the fact that the natives as a whole kept quiet during the commotions of recent times, but he takes care to state very explicitly that the colour-bar is a subject of general complaint. "Many of their young men were trained to trades in institutions, and by working alongside of Europeans acquired a considerable amount of knowledge, yet in Johannesburg these men were refused employment as tradesmen. Similarly, men who had been going steadily to the mines for ten years and more, and were qualified for posts as foremen, were kept as common drill hands. . . . When European agitators created a crisis everybody turned to the natives to see what they might do, but when things were running smoothly, by no sign or token were the natives shown that their loyalty was appreciated. The natives were simply kept down at the bottom of the ladder, no matter what their abilities may be."

Outlook on the Diggings.

Owing to the depression which has set in, in view of the European crisis, the outlook on the River Diggings gives cause for great anxiety. It is stated that diamond buyers will not pay the customary visits this week-end; and, as already reported, the Diggers' Union held a meeting at Windsorton, and resolved on the reduction of "boys'" wages to five shillings weekly. The "boys" are reported to appreciate the position which has called for these steps.

THE "SAFETY FIRST" MOVEMENT IN THE U.S.A.

Beneficial Results of Bureau of Mines' Work—Some Lessons for South Africa—Growth of Mine Reserve Stations—Improvements in Explosives—Reduction of Accidents—Progress of First Aid Work.

During the few years since the beginning of the mine-safety investigations authorised (during the winter of 1907-8) by Congress there has been a marked increase in the general interest taken by miners, mine owners, and the general public in all questions relating to safety; and, in spite of the fact that there has been a considerable increase in the amount of coal mined and in the number of coal miners employed, there has been a marked decrease in the number of fatalities and bodily injuries in mining operations. The increase in fatal coal-mine accidents in 1913, it is hoped, will be only a temporary break in this improvement. It is not claimed that, acting alone, the Bureau of Mines has brought about these changes for the better; nor, indeed, is it claimed that the bureau has been the main factor in bringing about these improvements. The bureau has endeavoured to organise and lead in this movement; it has conducted a series of investigations and has disseminated a large amount of information bearing on accident prevention, and in this work it has had the hearty aid and co-operation of the State mine inspectors, mine owners, the miners, and the mining journals of the country. A few of the most notable lines of improvement in the safety conditions in coal mines which the bureau has helped to bring about are as follows:—

WORK OF THE BUREAU ENCOURAGES MINE OWNERS AND STATES TO GREATER ACTIVITY.

One beneficial result from the work of the bureau is that it encourages research and inspection, the purchase of mine rescue and first-aid equipment, and the maintenance of mine rescue corps by the private mining companies. It is sometimes claimed that investigations and other activities on the part of the National Government discourage similar activities on the part of mining companies. But such has not been the case. On the contrary, the activities of the Bureau of Mines have increased the work of private laboratories and of engineers in private practice or employed by private mining companies, and in the various mining camps where our rescue cars have done training and demonstration work, mine-rescue and first-aid corps or squads have been organised quite generally among the miners and have been equipped and maintained at the expense of the mine owners. Meanwhile, also, the several mining States have enlarged and strengthened their inspection work. The extent of this private work is indicated by the following statement:—

Increasing Number of Privately Owned Mine Rescue Stations.

At the time the bureau first undertook the development of modern protective methods, both as regards rescue work at mine disasters and recovery work at mine fires, there were in the United States, as far as known, only a few sets of breathing apparatus, and these were in use by the metal mines at Anaconda, Mont. There are now owned and in use by 170 private mining companies 76 rescue stations and about 1,250 sets of such apparatus, besides auxiliary equipment for fire fighting, in addition to the large number of such apparatus owned by the bureau and widely distributed among its various cars and stations. The bureau has endeavoured to extend the movement for the establishment of rescue stations patterned after its own, at which miners may be locally trained in mine rescue and first aid work, so that there will be immediately available in times of disaster groups of organised men trained in scientific and rational rescue and recovery methods. There are now in the different parts of the country several hundred such groups of men. A number of the larger mining operators have established 76 rescue stations, mine operators now own 12 and two States own 4 rescue cars equipped somewhat after the manner of those operated by the Bureau of Mines; the movement has otherwise been vigorously developed not only in the coal-mining but to some extent in the metal-mining districts. The next logical step in the organisation of this work is now being taken in two mining districts, namely, that of establishing central rescue stations owned and controlled by groups of mine operators. By this plan instead of each mining company having a few sets of rescue apparatus and a few men trained in the work, a much less individual expenditure establishes a well-equipped corps of professional rescue men at a group of mines. As a result there is available in time of disaster a number of men who keep in physical condition for the arduous work of mine rescue, and who have their apparatus and equipment ever ready for an emergency, as compared with the amateur forces now available, who, scattered among different mines, are not able to keep themselves and their equipment in the best condition of preparedness. Gratifying as has been the progress in turning over to the States and operators the local training and rescue operations, there has been no diminution in the demands received by the bureau for its assistance in organising and guiding such work. The rescue force of the bureau is merely relieved of the maintenance of the many private stations taken out of the burden of ordinary rescue work. Its efforts are devoted to the pioneer educational work in the various districts and to the training of many thousands of miners; for this purpose the services are now required to an even greater extent than in the past for the training of private rescue-station forces and for inspection and advice concerning the care of their equipment, and for information regarding the latest progress in all lines of rescue and first aid work.

IMPROVEMENTS IN MINE EXPLOSIVES.

A revolution has been brought about in the explosives used in coal mines containing inflammable gas or dust. At the time of the inauguration of this work black powder, with its long flame and poisonous gases, was almost universally used in coal-mining operations in the United States. One of the first investigations undertaken by the bureau was that looking to improvement in the character of the explosives used. As a result of conferences with mine owners, miners, and manufacturers of explosives, a number of these manufacturers agreed to undertake the making of a new type of explosive that would have for its special characteristics an explosion flame of short duration and relatively low temperature. The bureau co-operated in the development of this new type of explosives by establishing the necessary standard with regard to safety, and by testing the explosives submitted from time to time to determine whether they had reached such standard, or the manner in which and the extent to which they failed to reach such standard. As a result of this work, within a little more than three years' time, the use of the new type of explosives, termed "permissible explosives," has become general in those mines where the risk of gas or dust explosions was a serious one. So rapid has been the introduction of the permissible explosives that, during 1912, more than 18,000,000 pounds of these explosives were used in the coal mines of this country. The present work of the bureau along these lines is to assure further improvements in these explosives, and especially to reduce the quantity of poisonous gases given off in firing shots, and to reduce the shattering effect of these shots: and also to bring about safer methods of handling and firing whatever explosives may be used in mining.

LESSENED DANGER FROM USE OF ELECTRICITY IN MINES.

Notwithstanding the large increase in the use of electricity in coal mining operations, and also the increase in the number of mines in the past few years, there has been no increase in the number of fatalities from electric shock or burns, as the following table shows. But the ignition of gas and dust by electric short circuits has, it is believed, been the cause of certain great explosions that resulted in a large number of fatalities not included in this list.

Fatalities in coal mines due to electricity and to gas and dust explosions.

[Figures for 1907-1909 based on those of United States Geological Survey. Figures for 1910-1912 based on those in Bulletin 69, Bureau of Mines.]

Year.	Total Killed.	Killed by Gas and Dust Explosions.	Killed by Electricity (Shock or Burns).	Number Killed per 1,000 Employed.	
				Gas and Dust Explosions)	Electricity (Shock or Burns).
1907	2,125	947	*	1.39	*
1908	2,450	396	*	.57	*
1909	2,412	341	*	.51	*
1910	2,840	518	79	.71	0.11
1911	2,719	379	87	.52	.12
1912	2,360	301	76	.40	.10

* Electricity not given as separate cause.

The bureau has conducted an investigation concerning the insulation of electric wires in coal mines and has recommended a number of improvements. It has conducted a series of investigations with a view of developing explosion-proof motors, approved types of fixed and portable electric lamps, and better electric signals in mines, regarding all of which there is serious need of additional research.

REDUCTION OF MINE EXPLOSIONS.

The mine-safety appropriations of the Bureau of Mines have been more largely devoted to a possible reduction of mine explosions than to any other phase of mine-safety work. Congress made its first appropriation for investigation into the causes and possible prevention of mine explosions in 1908, and appropriations for carrying forward such an investigation have been made each year since that time. Extended laboratory tests have shown the differences in explosibility of coal dust collected from different coal mines in different parts of the country, and this particular line of research has been much facilitated by the opening of the experimental mine at Bruceton, Pa., which has, however, been ready only within the past few months for the making of serious investigations. As a result of these researches and the educational campaign carried on by the engineers of the bureau with the co-operation of State mine inspectors, mine operators, and the miners, the proportionate loss of life from mine explosions decreased from 30.3 per cent. of the total deaths in 1907 to 12.7 per cent. of the total deaths in 1912. Although, unfortunately, mine explosions continue to occur not only in the United States but in other countries, much information is being gathered concerning the causes of such explosions, and it is believed that with a few years more of continuous investigation and educational work, the causes will be so understood that the application of more thoroughly preventive measures will be practicable and that then these awful disasters may be entirely prevented.

General Reduction of Mine Accidents.

Although the investigations of the Bureau of Mines during the past few years have been limited largely to the problems relating to coal-mine explosions and the causes of such explosions, including explosives, electricity, open or defective lights, etc., the general educational work has included all classes of mine accidents, and through the co-operative efforts of mine inspectors, mine owners, and miners there has been a reduction in the aggregate number of coal-mine accidents and a general improvement in mine-safety conditions. There has not, however, been a similar decrease of fatal accidents in the metal mines of the country, nor has the bureau been able to extend its investigations and educational work as it should to that branch of the mining industry. The decrease in the loss of life in coal mines since 1907, the year prior to the beginning of the mine-safety investigations authorised by Congress, is shown by the following tabular statement :—

Number of men killed in and about the coal mines in the United States in the calendar years 1907 *to* 1912, *inclusive, with death rates.*

Years.	Number Killed.			Production per Death (Short Tons).
	Total.	Per 1,000 employed.	Per 1,000,000 Short Tons Mined.	
1907	3,197	4.88	6.93	144,325
1908	2,449	3.64	6.05	165,346
1909	2,668	4.00	5.79	172,699
1910	2,840	3.92	5.66	176,618
1911	2,719	3.73	5.48	182,501
1912	2,360	3.27	4.42	226,469

In the fiscal year ending June 30, 1913, engineers of the Bureau of Mines investigated 76 accidents; of this number 6 were not properly mine accidents, so that the number of mine accidents investigated during the year was 70. The principal items in regard to these accidents were as follows:—Accidents investigated, 70; total number killed in accidents, 223; suffocated, 42; rescued by Bureau of Mine-men, 12, rescued by others, 90; escaped unassisted, 142. The causes of these accidents are stated in the following list:—Lightning, 1; cave-in, 4; flooded mine, 2; fire, 19; explosion, 33; hoisting, 2; fire and explosion, 4; opening a fire area, 2; mine cave and fire, 1; black damp, 1; collapse of tipple, 1. Total, 70.

Growth of Mine Rescue and First-Aid Work.

The improvement in behalf of better and more extended mine-rescue and first-aid service at the larger coal mines of the country has gone forward slowly but steadily. Each of the bureau's mine-rescue stations, and especially each of its mine-rescue cars, has been the means of carrying forward this important improvement. In this work, as in its other efforts for greater safety, the bureau has had the active co-operation of the mine inspectors, the mine owners, and the miners, and in extending first-aid work in connection with mining operations it has had the active and helpful co-operation of the American National Red Cross. The mine-rescue and first-aid training has now been under way more than three years, and during this time 31,203 miners have been trained in the use of the necessary equipment and methods. In connection with mine disasters the Bureau of Mines men have rescued, through the use of breathing apparatus, 83 miners. A larger number of miners have been rescued by others, many of whom were trained or aided in the use of modern rescue methods by the bureau, and a very much larger number of miners have been aided or brought to recovery through the prompt first-aid work of miners trained by the bureau, by the American National Red Cross, and by other agencies. In addition to the actual saving of life, an important part of the work has been the lessening of the suffering of injured miners through the prompt and expert services of the men trained in first-aid work. This work has not only reduced the severity of injuries and kept some men from dying, but it also has enabled miners to resume work much sooner than they could have otherwise. This is a conservation that is difficult to estimate in dollars and cents.

THE DOMINIONS ROYAL COMMISSION REPORT.

How the Mining Industry has Built Up South Africa—Significant Facts and Figures—Points on Labour and the Output—Pros and Cons of Amalgamation.

At the outset the report states that South Africa occupies a unique position amongst the civilised States of the world in the extent of its dependence upon the produce of its mines for its purchases of imported goods. It is observed that four salient conclusions emerge from an examination of the facts and figures collected in regard to the oversea trade of South Africa, viz.: (1) That the greater portion of that trade is carried on within the Empire; (2) that the purchasing power of South Africa, under existing conditions and pending more complete development of its agricultural resources, is dependent to a peculiar extent on the produce of its mines; (3) that the prosperity, the maintenance, and the development on economic lines of the mining industry are therefore not merely matters of importance to the shareholders, or to the population of the mining centres in South Africa, or even to the Government of the Union, but concern the Empire as a whole; and (4) that as mines are of the nature of wasting assets, the permanent prosperity of the country also demands urgently the further scientific development of its agricultural wealth. In the Commissions' opinion, however, the most immediate of the problems which have come before them in South Africa is that of developing on the lines of the maximum efficiency the wealth derived and derivable from its mineral resources. The coal deposits are described as enormous, but comparatively undeveloped. In 1913 the total output only amounted to 8,800,000 tons, valued at something over £2,200,000. The possession of abundant and easily-worked coal may also be of great value in future years in the development of subsidiary industries in the Union, particularly as an aid to working the undoubtedly large iron deposits which exist at several points. Figures are given to show the importance of the South African diamond industry. The value of the output of diamonds in the Union of South Africa in each year from 1906 onwards is recorded thus:—1906, £9,547,000; 1907, £10,990,000; 1908, £5,407,000; 1909, £7,209,000; 1910, £8,289,000; 1911, £8,746,000; 1912, £10,061,000; 1913, £11,389,000. Of the three principal centres, Kimberley, Jagersfontein, and the Premier Mine, the Kimberley output is about six millions sterling annually. The mines at Kimberley are by no means working at their full capacity, and the present output could be doubled without additional plant. In December, 1912, the total number of employees was 43,400, of whom about 4,900 were white and 38,500 natives and coloured. The total wages paid to white employees in 1912 amounted to £1,245,000 and to natives £1,599,000. The Union in 1912 produced about 80 per cent. of the world's supply of diamonds, a considerable portion of the remaining 20 per cent. coming from German South West Africa. Although the deposits of coal and of diamonds are of vast importance to the country, and although in both cases a very prolonged future may be predicted, still greater importance must be assigned to the gold industry. It is remarked that gold mining as an organised industry in the Transvaal, although less than thirty years old, has already contributed £400,000,000 to the world's stock of gold, and at the present time nearly 40 per cent. of the total annual output of the world is derived from this source. The report proceeds:—

Present Position and Cost of Production on the Witwatersrand.

The three main features which characterise the gold fields of the Witwatersrand are: (*a*) The vast extent of the deposit; (*b*) the comparative regularity of the ore contents; (*c*) the lowness of the average grade and the small margin between recoverable value and working costs. The last point, which is of capital importance in considering the best methods of administration and development, may be exemplified by a statement read by Professor J. G. Lawn to the Select Committee of the House of Assembly on European Labour in April, 1913. Calculating the working capacity of two Europeans as equal to that of three natives, he estimated that if natives at their present cost per shift—viz., 3s. 2d. per head—had to be replaced by Europeans at 10s. (and this appears to be the minimum wage at which Europeans can live in the Transvaal), out of 52 producing mines for which figures are available 26 would cease to make a profit. If, instead of receiving 10s., the white labourers replacing natives were paid at the rate of 12s. 6d., about the current rate in Western Australia, where living is cheaper, out of the 52 mines 35 would cease to make a profit. The same point may be put in another way. The average cost of native labour is 3s. 2d. per shift, including the cost of food, recruiting, and compound expenses in addition to money wages. It has been calculated in a statement drawn up by the Chamber of Mines that a rise of 1s. per shift in the cost of native labour, assuming efficiency and other conditions to remain as at present, would involve the closing down of five mines, whilst every additional 1s. per shift would cause additional mines to close down until, if the cost were increased by 7s. per shift, only six out of 52 mines would remain working. It would thus seem that efficient and relatively economical native labour is an indispensable condition to the payability of most of the Witwatersrand mines. Without this many mines would have to shut down if worked on anything like present lines. Figures quoted show the value of gold recovered, the working cost, and the average working profit per ton of ore raised during the last decade. It is obvious that the lower the working costs can be reduced the greater will be the tonnage workable at a profit, but no detailed estimate has been published showing the extent to which that tonnage would be increased by the reduction of working costs to, say, 15s. or 12s. per ton.

Future of the Gold-Mining Industry.

No general survey of the position can be complete without some mention of the probable future of the gold-mining industry. Into the technical questions involved we have not the competence to enter, nor, indeed, is any technical inquiry necessary, as the Chamber of Mines lately commissioned four leading consulting engineers to prepare a report on this subject for the Economic Commission. The result of their inquiry, which extended over several months and involved a minute examination of the assay plans on the whole of the Rand, is reproduced as Appendix IV. to the evidence which we took on Mining. Broadly speaking, this statement is to the effect that the present producing mines of the Witwatersrand have about [illegible] tons of ore which could be worked so as to yield a profit, however small, above present costs. These mines to-day are crushing at the rate, approximately, of [illegible] tons per annum; this rate, it is estimated, may be maintained during the next five years, but after that date, owing to the exhaustion of the short-level properties, the annual output will decrease at such a rate that by [illegible] it would fall to about half the figure quoted. The estimate is based on the maintenance of working costs at their present rate; it makes no allowance for either an upward or a downward movement. It also assumes that the remaining undeveloped ground down to a level of 7,500 feet will be of equal tonnage and value with the last 1,000 feet of all workings throughout the length of each mine. No allowance has been made for any flattening of the reef or for any impoverishment with depth, although such impoverishment is by no means improbable in view of the average results already attained along the reef. The depth of 7,500 feet has been arbitrarily taken, not because it is considered that the mines will be payable to that depth and unpayable beyond, but because the Mines Department has intimated that it is not at present willing to consider the proclamation of ground in which the reef is estimated to be below that depth. It is important to observe that the estimate of future production relates to tons crushed; it does not apply to gold produced, which, if richer mines are exhausted first, would be reduced at a more rapid rate than the tonnage. We believe that the conclusions summarised above represent an impartial review of the position of the present producing mines so far as it can be judged in the light of present knowledge. We venture to think that adequate importance has not been attached by the public to this report, possibly because it has been considered as inspired by the desire to avoid further taxation of the gold industry, and as animated throughout by an intentional pessimism. We are not dependent solely on the figures of the Chamber of Mines for an estimate of the life of the gold mines of the Rand. Mr. R. N. Kotze, the Government Mining Engineer for the Union of South Africa, also furnished us with evidence on the question. Mr. Kotze stated that he had no serious criticism to offer on the estimate of the Chamber of Mines as to the life of producing mines. He himself estimated the tonnage of payable ore which could be mined from the present producing mines at 387 million tons, a result only slightly in excess of the estimate previously given. Mr. Kotze has also supplied figures showing the rate of exhaustion of the mines based on their lives as fixed for mining taxation purposes. He estimates that by 1921 [illegible] mines which are now producing gold to the value of [illegible] annually will cease operations; by 1931 a further [illegible] mines now producing at the rate of £[illegible] will have dropped out; and by 1941 some more mines now producing nearly £[illegible] will cease working. According to this estimate, in [illegible] years' time the output from the existing Rand mines will have fallen from £[illegible] to something like £[illegible]. In addition, however, to the tonnage of ore in mines now producing, there are large undeveloped areas in the Rand which are known or believed to contain ore. Mr. Kotze estimates the total extent of these areas which do not belong to producing mines at [illegible] claims. Of this total he calculates nearly [illegible] claims would be payable. On this basis and with due reserve he estimates the total number of payable tons of ore in the unexploited area as [illegible]. This compares with [illegible] tons mined on the Rand down to the end of 1913, and 387,000,000 tons according to his estimate still to be mined on present producing mines. If the above estimates may be accepted as correct, the following result is arrived at:—Tonnage already mined, [illegible] millions; probable payable tonnage left in producing mines, 387 millions; probable payable tonnage in new areas, [illegible] millions; total, [illegible] millions. We are not prepared to put forward any estimate of the value in gold content of the two categories last mentioned. We desire to emphasise the fact that if any one or all of the conditions upon which the Chamber of Mines and Mr. Kotze base their conclusions are in any way adversely affected, their estimates would be seriously disturbed.

INTEREST OF GOVERNMENT IN UNDEVELOPED AREA.

We wish to call particular attention to the importance of the Government interest in the undeveloped areas. This lies not merely in the Far East Rand, [illegible] the Chamber of Mines [illegible] claims [illegible] the mining rights in [illegible] are vested in the State. It is thus clear that the Government, in addition to deriving a large present revenue from the gold-mining industry, has [illegible] in the development and extension of the Rand. [illegible] Mr. Kotze's [illegible] prove payable, [illegible] there would be [illegible] payable tons of ore within the control of the Government. If the profits accruing to the Government amounted to [illegible] per ton, [illegible] approximately half the present total debt of the Union of South Africa. We only quote these figures to enforce the argument [illegible] in this report that the most vital interest of the Union Government to-day is [illegible] of the mining industry on a basis of maximum efficiency. [illegible] depends upon the working costs as compared with the gold extracted, and working costs depend more upon skill in organisation and good management and upon efficiency of labour than upon any other consideration.

The total amount paid in wages and salaries by the gold mines of the Rand amounted to £12,900,000 in 1913. The average wage of the white employee (excluding the technical and clerical staff) was £316 a year, whilst that of the native was £30, allowing an additional £10 for the housing of the native and the rations which he receives. The report has a good deal to say about the inefficiency of the white miners, and their restlessness. The Commission endorses the recommendation of the Economic Commission for the abandonment of the contract system. While recommending better remuneration to a restricted number of whites, the Commission doubts whether full advantage has been taken of the natural facilities for cheap coloured labour, and it specially criticises the economic aspects of the recruiting system. The report favours the "extension upwards of the sphere of the native labourer to fill the place of the inefficient white worker," that is to say, an abolition of the "colour bar." The establishment of native locations on the Rand is also favoured, possibly in conjunction with the closed compound system. The report then continues:—

AMALGAMATION OF THE WITWATERSRAND MINES.

The view usually taken in South Africa is that it is matter of indifference to the community whether a mine is making a profit or not provided that it is not shut down. The underlying suggestion is that money paid in dividends is lost to the country, and that the only thing of interest to South Africa is that as large a sum as possible should be spent in costs or divided among the subsidiary trades with which the industry is surrounded. The statement read by Professor J. L. Lawn to the Select Committee on European Labour, to which we have already alluded, exemplifies this point of view. A mine which pays nothing to its shareholders, it is there stated, is "in the nature of an unmerited asset to the country. It is of just as much benefit as if it were a rich mine, and yet the shareholders receive nothing." Mr. Kotze, the Government Mining Engineer, took the same attitude in giving evidence before us. It appears to use that this opinion is incorrect, being founded upon an incomplete view of the situation. It leaves out of sight the obvious fact that a non-paying or low-profit mine by competing for an inadequate labour supply largely diminishes the productivity of the richer mines by diverting necessary labour. The Government receive no return on account of the gold extracted, and the Profit Tax is thus directly diminished. Again, capital is not being invested in the most profitable fashion. We think that the Government and the mining industry might usefully co-operate in making careful investigation into the results which might be expected, were labour to be redisributed in such a way that the best mines would be developed first and the poorer later. The present uneconomical method of working has two further far-reaching results. There is naturally constant pressure to economise in the expenses of white labour, and therefore a tendency to generate friction. In the sphere of native labour the system has probably been one of the causes why further reward to individual skill and industry has not been more generally adopted. We may add that to diminish the productivity of the mines considered as a whole, by increasing uneconomically the competition of one mine with another, is deliberately to augment the difficulty of finding the large sums of capital necessary for the development of new areas. So far from being an unmerited asset to the country the non-paying mine may be regarded as a common enemy. We have thought it well to set out these arguments because they have an important bearing on a further aspect of the mining problem in South Africa with which we wish to deal, viz., the question of amalgamation of the Witwatersrand mines. Public attention in the Union is, we believe, being turned to this matter to an increasing extent, while the great success of the consolidation of the rival diamond interests at Kimberley which was completed in 1888 forms an interesting and important precedent.

Precedent.—The interests concerned are, indeed, much larger, the total capital represented by the Witwatersrand mining companies being approximately £80,000,000, as compared with a value at the time of amalgamation of the diamond interests at Kimberley of about a tenth of this amount. But since 1888 the world has become accustomed to large fusions and to large figures, and the sum of £80,000,000 is moderate compared with the capitals of other joint stock concerns. The Steel Trust of America represents a total value of some £[illegible], the Canadian Pacific about £160,000,000, the London and North Western Railway £130,000,000, and the Pennsylvania Railroad about £128,000,000, while several combinations in America far exceed an aggregate value of £100,000,000 each. The capital value of the South African railways, which were amalgamated under one administration four years ago, is about £80,000,000, or nearly the same estimated present market value of the Rand mines.

Advantages and Disadvantages.—It may be well to enumerate shortly the main advantages and disadvantages which, it is suggested, amalgamation would entail. The following are held to be the principal advantages:—(1) The saving of much that is redundant and unnecessary owing to the present system of management by groups, with numerous organisations to deal either with their individual interests or with the general points of contact. (2) The unification of the direction of the industry with a view to the removal of dividend [illegible]. It is alleged that under the existing régime the heads of the various Administrations are more concerned to gain temporary or minor advantages for their own groups than to regard the general interests of the industry and to pursue a common policy for the working of the mines. From this point of view amalgamation may be regarded as one of the paths to reform, possibly the most direct. The industry would acquire unity of direction and increase of strength in dealing with the numerous obstacles and vested interests which now impede its progress. (3) Removal of engineering difficulties, such as are now caused by the division of the mineral deposits amongst several owners. This, as well as the economy of labour and the saving to be effected by the abolition of redundant directing bodies, will tend to reduce working costs, and consequently increase the life of the Rand. (4) The introduction of collective bargaining between the representatives of capital and the representatives of labour, and the elmination of many causes of smaller strife. It is clear from the report of the Economic Commission that but little has yet been achieved in this direction. (5) The elimination or mitigation of the market factor which has bulked so largely in the eye of Johannesburg. It is a current saying there that more money has been made in the market than in the industry. While this belief is prevalent it is probable that the most active brains will not devote themselves exclusively to improvement of the industrial position. The following are held to be the probable disadvantages :—(1) Amalgamation might diminish invention and energy, which now result from competition. (2) Difficulty would be found in directing the large mining combination which would be created. (3) It might be considered disadvantageous to labour in that it would eliminate the competition which now exists between different mines for workmen. (4) Amalgamation might create an interest in the State so powerful as to be a menace to Government authority. We have heard several witnesses on the various features of the question. Mr. Schumacher, who represented mines which contribute nearly 50 per cent. of the total dividends, though recognising, in common with almost every other witness whom we examined on the subject, the economic desirability of amalgamation, considered the difficulties in the way of its realisation as almost insuperable. Mr. Nathan, whose views may be considered typical of those of the smaller groups, was an ardent advocate of the principle. The Government representative, Mr. Kotzé, while regarding amalgamation as an advantage to the country, the shareholder, and the worker, seemed to consider that the amalgamations already achieved had done all that was possible. It was not precisely apparent, however, why, in his judgment, if past amalgamations were desirable, a further extension of the same principle should be less so. Of the representative of labour, Mr. Wybergh, who regarded amalgamation as natural and inevitable, cordially favoured it as leading, in his opinion, directly to State management. Mr. Tom Matthews, the General Secretary of the South African Miners' Union, apeared also to favour any approach the State management. We, ourselves, hold the view that at some time or other amalgamation will probably come, but it may be that the moment will be deferred until the industry is far past its meridian. The matter appears to us to depend largely upon the attitude of the Government, and also to turn upon the question whether the admittedly urgent reform in the administration of the industry can be obtained within a reasonable period without resort to so radical a modification.

Government Control and Co-Operation.

Dependence of the Government on mining revenue is a point which is emphasised in the report. Mr. Leisk, the Secretary of the Finance Department, states as his deliberate opinion that 60 per cent. of the revenue of the Union are directly or indirectly attributable to the mining industries. Apportioning this 60 per cent. between the Witwatersrand on the one hand, and other mining centres on the other, the Commission estimate that three-quarters of the mining revenue, or 45 per cent. of the total revenue of the country proceed from the Rand ; in other words, out of a total Government revenue. amounting to about £27,000,000 derived from taxation and railway receipts, the Rand contributes about £12,000,000. This compares with £8,000,000 paid to shareholders, and with £8,000,000 paid to white miners and other white employees. It will thus be seen that the interest of the Union Government in the gold mining industry of the Rand is 5 per cent. greater than that of the shareholders or the white employees. The present large share of the Government in the profits of the industry is more likely to increase than diminish. Concluding its observations on the gold industry, the report reads : In matters of technical reform wise suggestions are of little avail unless they proceed from an outside authority of acknowledged position. This was shown by the recommendations of General Gorgas and the Economic Commission, which, had they proceeded from an internal source only, would probably have been ignored, but which, as it is, have commanded respectful attention and a large measure of general assent. Similarly, assistance might be invoked with regard to other aspects of the problem, and specifically to the means for obtaining further co-operation between the Government and the industry. A world authority on mining matters, more especially if he had the assistance of someone well versed in labour conditions in older countries and in the settlement of labour disputes, would obtain respectful hearing and an amount of attention that no local representations could probably command. We suggest, therefore, that it is expedient for the Government to obtain as their advisers on the subject the highest authority or authorities that the mining world can offer and to enlist their services for a temporary mission of great or less duration. The cost would be insignificant where such immense interests are involevd. For such a mission to succeed it would have to attain two ends : first, a higher amount of practical unity and cohesion among the groups ; secondly, a far larger degree of co-operation between the Government and the industry than has hitherto obtained. Neither is impossible ; the second we believe to be easy of attainment. Both are eminently desirable. The Commission observes that "the extraordinary progress of mining in South Africa has overshadowed the development of agriculture." What the report has to say under this head we shall refer to elsewhere.

In a recent article in the *Engineering Magazine*, Dr. Douglas dwelled upon the destructiveness of the labour movement as heretofore conducted, and with his philosophic perception pointed out whither it is leading us, and urged a better recognition of things as they are and must be ; and a better attention to the principles of co-operation. Among other things, he said :—

> But it should be possible to devise a scheme by which capital and labour would co-operate to the mutual benefit of both. Consolidated capital, applied to industrial operations, receives profitable return only when correct business methods are employed. Profit-sharing has been tried, and is possible in communities of settled population, where the shop or the mill or the mine, and the men who own it and operate it, reside in the locality permanently from generation to generation. It is difficult to apply it to our shifting industries and industrial population. But surely some other method of mutual participation in the common welfare might be devised. For instance, if labour unions were incorporated, and their leaders were made answerable for the administration of their funds, and the surplus funds were used for investing primarily in the securities of the identical enterprises in which the men were themselves working, the men would thus become joint owners in the company. Even such small scattered holdings as the men now have, say in the subsidiary companies of the iron and steel industries, if held and voted as a unit, would constitute a notable factor. Their full influence might be secured through proxies, but as powerful a force would not be exercised by each man acting for himself, as if the total holdings of all the men were handled by a holding committee. The men would be borrowing methods from their masters. In most manufacturing and mining enterprises men are well paid, and, if the inducement to save were stronger, the amount accumulated for investment would be very considerable. And if the investments were made in the funds of the companies for which the men work, it would not only give them a voice in the management, but it would give to the enterprise itself a more stable character ; for men who have an interest in the work would not come and go as is their wont, nor throw up their jobs on the most trivial excuse. They would, as shareholders, look at the works as their own, and take in them the pride of ownership.

There are numerous corporations, big and little, that are doing this very thing, *i.e.*, interesting their employees as stockholders, making them veritable partners in the business. The biggest corporation of all—the United States Steel Corporation—is a leader in this movement. At the last annual meeting of the stockholders of the Steel Corporation several of its employee-stockholders, holding the proxies of their fellows, were present, and with Judge Gary in the chair the doings of the company, especially as related to its employees, were discussed. Several of the workmen made interesting statements as to the existing conditions in the steel industry in so far as working conditions are concerned. One of them, Mr. Maitland, remarked : "This corporation is doing more for humanity than the United States is doing for humanity." Another, Mr. Smith, said : "I sometimes feel that some of our demagogues who pretend to be the labourers' greatest friends, after all are the labourers' greatest enemies." It certainly is a new departure in the meetings of corporations when individual stockholders, who are employees, appear and speak in the strain they did at the Steel Corporation's meeting. May not this growing movement be the dawning of a better day and a clearer understanding between employer and employee? And may not the demagogues now rampant and the self-seekers now paramount in the council rooms of organised labour find that they have been backing the wrong horse?

Mozambique Macequece.

The report of the Mozambique Macequece, Ltd., for 1913, presented at the meeting of the 15th inst., states that, as mentioned in last report, possession was given to the option holder in January, 1913. The rent of £80 a month was received for the first five months only of the option ; that is, to 30th June, 1913, when default of payment was made. An action is now pending against Mr. C. Aubert in the Mozambique Courts for arrears of rent and breach of contract. The accounts submitted show a debit balance of £578, which is partly accounted for by the cost of unwatering the mine in connection with the option agreement entered into. This expenditure extended into 1913, and since the expiry of the option it has been considered advisable to continue the unwatering of the mine. The funds in bank and sundry debtors amount to £4,346, as compared with £5,044 at end of 1912. The sum of £7 was received in payment of outstanding calls. There has been more mining activity of late in the Mozambique territory, and the directors are in hopes of interesting other parties in the property either by way of lease or sale.

THE ECONOMIC USE OF WORKMEN ON THE RAND.—III.

Continuation of Mr. E. J. Way's Thoughtful Paper.

[illegible] The scarcity of workmen has of itself led to more economic management. The following table shows this:—

[illegible]

Year	Tons Milled.	Total Value of Yield.	Total Costs.	Total Profits.	Dividend Paid.
	£	£	£	£	£
1904	[illegible]	[illegible]	—	—	3,877,624
1905	[illegible]	[illegible]	—	—	4,774,549
1906	[illegible]	[illegible]	—	—	5,765,069
1907	[illegible]	[illegible]	—	—	6,902,420
1908	[illegible]	[illegible]	[illegible]	12,011,2[illegible]	8,536,773
1909	[illegible]	[illegible]	17,[illegible]	11,704,876	9,310,751
1910	[illegible]	[illegible]	18,792,388	11,216,105	8,887,185
1911	[illegible]	[illegible]	21,408,4[illegible]	11,115,861	7,763,[illegible]
1912	[illegible]	[illegible]	25,711,[illegible]	12,678,095	7,[illegible]
1913	[illegible]	[illegible]	[illegible]	12,171,8[illegible]	8,[illegible]

Year.	Numbers Employed.		Ratio of White to Coloured.	Tons Milled per Employee.		Results per Ton Milled.		
	White	Coloured		White.	Col'd	Costs	Profit.	Yield.
1904	[illegible]	[illegible]	[illegible]	618.5	103.1	21/4	[illegible]	38/6
1905	[illegible]	[illegible]	1 to 8.12	687.7	84.6	23/6	12/6	[illegible]
1906	[illegible]	[illegible]	1 to 7.86	788.5	99.1	22/2	12/6	34/6
1907	[illegible]	[illegible]	1 to 9.28	[illegible]	94.8	20/10	13/3	33/11
1908	[illegible]	[illegible]	1 to 8.17	1,034.3	112.7	18/[illegible]	13/5	31/5
1909	[illegible]	[illegible]	1 to 8.19	[illegible]	121.5	17/1	11/6	28/11
1910	[illegible]	[illegible]	1 to 7.77	[illegible]	116.5	17/7	10/6	28/6
1911	[illegible]	[illegible]	1 to 7.85	[illegible]	125.7	18/-	9/7	27/11
1912	[illegible]	[illegible]	1 to 8.08	1,078.0	132.3	18/8	10/-	29/-
1913	[illegible]	[illegible]	1 to 7.87	1,109.2	135.1	17/11	9/6	27/9

It will be seen that the tonnage milled per white employee has increased [illegible] per cent. and per black and coloured employee 3[illegible] per cent. in nine years. There are other exceedingly interesting deductions to be drawn from this table, but time will not permit me to do this on the present occasion. It will serve no purpose to treat the matter with [illegible]. In our own time we have seen the rise of the yellow man. [illegible] conservation of ideas and [illegible]

Bearing on Health and Safety.—Having looked at the possibilities which exist with regard to the economic employment and management of white, black and coloured labour, it is now necessary for me to mention whether health and safety would be endangered under a larger native supervision as compared with conditions at the present time. Ventilation would be carried on in the ordinary way, and the allaying of dust underground would be done by persons who are responsible for this at present, and consequently these conditions would not change. If we give the views of a well-known mine manager on this subject, who has given the matter very great attention, the following would be an outline of the work scheme which would probably be most suitable on single shift throughout:—

Marking Work.—Arrangements would be [illegible] on the following lines: [illegible]

Hammer Work.—The same remarks apply to [illegible] drilling, but [illegible] would be able to point the holes for the gang.

Timbering.—This would be done on the day shift under the supervision of the chief supervisor.

Watering.—This would be done on both day and night shifts by natives as at present, under the supervision of the overseers.

Tramming.—This would come under the supervision of the chief overseer of the district. The effect of these conditions on the health and safety of underground employees would be:—

Health.—Whether a mine is healthy or not depends largely on the conditions of air underground, on sanitation, and, as is known in the last few years, on the amount of dust in supension in the workings. With regard to ventilation, it will of course, be clear that the proposed arrangement would not affect this in any material way. Further, it has been shown that the allaying of mine dust would be done by the persons who are responsible for this at present. In the drilling of holes, since the supervision will be done by competent overseers, it may be safely assumed that great care will be exercised to see that no dust is allowed to escape. On the whole, a more satisfactory state of things may be expected, since the overseers will have no reason to take risks, or hustle their workers, which is a reason given to explain the carelessness of some contractors and others to-day.

Safety.—The analysis of the causes of accidents given in the report of the Government Mining Engineer, page 117, year 1912, is as follows:—

Cause.	No. of Deaths.	Percentage.
Falls of ground	316	32.02
Trucks and tramways	66	6.69
Falls of material	100	10.13
Explosives	210	21.28
Machinery	30	3.04
Falling in shafts, excavations, etc.	64	6.48
Struck by skips, cages, etc.	57	5.77
Other causes	144	14.59
	987	100.00

It will be evident from these figures that falls of ground and accidents from explosives are responsible for a large proportion, namely, 53.3 per cent. of the total deaths during the year. Now, of all accidents due to falls of hanging, 11.4 per cent. were proved to be due to the carelessness of the white man. Again, of all accidents due to misfires and the use of explosives 11.1 per cent. were caused by the neglect of the white man. A very careful examination has been made of the Government records, and a great many cases have been selected for accidents from which deaths or major injuries resulted, which were entirely due to the carelessness or neglect of the white ganger. Some instances of neglect on the part of miners may be of interest, and hereunder are given a few cases of accidents which occurred during 1912 which were due to the carelessness of gangers. There were many more similar to these. 1. Accident caused by drilling into misfires, whereby the miner was injured, one native killed and two injured. The native who escaped gave evidence to the effect that he warned the white man that he had not plugged his old sockets, and not to drill in the way he did. He said he had seen his ganger clean out old holes with a scraper, and he had been told to go on drilling in the scraped-out socket, and if he refused the white man did it himself. An explosion took place with the result stated above. 2. Accident caused by fall of hanging, whereby one native was killed and three injured. Here one of the injured boys pointed out the conditions to his ganger. He would not even sound the reported unsafe place, with the result as stated above. 3. Accident caused by fall of hanging, whereby three natives were killed and five injured. Warnings were given of the danger under this particular place, by the falling of small pieces of rock, and the natives informed their ganger that they feared a large fall of ground. He took no notice, with the above result. 4. Another accident which resulted in the death of four natives and injuries to three, was also caused by the ganger insisting upon boys working in a stope which they knew was dangerous, and about which they spoke to him, with the result that he drove them back with threats. These facts are collected from 120 selected cases. From the figures given it will be seen that by the adoption of the scheme already outlined a considerable improvement may be expected since the work would be carried out under the supervision of more experienced miners. It is, therefore, considered that with competent overseers receiving good monthly wages in charge of a small section of the mine, better results would be obtained than with a larger number of gangers—some inexperienced—with shift bosses to supervise large sections. This opinion is supported by the lack of interest shown by the average miner in the safety of his working place, and in the health conditions obtaining there. This attitude makes it necessary for shift bosses to be constantly reporting breaches of the Regulations, and it is thought that by having a man of the standing of a shift boss in charge of a limited number of places very much greater care will be exercised than is the case to-day, when miners consider it a hardship to perform any work from which they will not directly profit.

(To be continued.)

Rhodesian Section.

LATEST MINING NEWS.

The June Output—Rhodesia Chamber of Mines—Congo Tin.

The total value of Southern Rhodesia's mineral output for the month of June has been officially declared at £321,625, compared with £315,700 in May, and constitutes a record month's production for the territory. The figures for the two months read as under:—

	May.	June.
Gold	£290,062	£306,421
Silver	1,028	1,053
Lead	226	174
Chrome Iron	13,475	3,405
Coal (sales)	10,215	10,196
Asbestos	—	—
Diamonds	694	376
Total	£315,700	£321,625

As will be seen from the foregoing tables, this record total was entirely due—the month's figures for chrome iron and coal showing decreases—to an enlarged gold production, which is all the more satisfactory in view of, comparatively, a shorter month's run. Bulawayo District's total was increased by about a thousand ounces, and one or two especially good returns are noticeable here. The Antelope's figures, for example, improved by some 400 ozs., while good results from the Fred Mine, the Farvic, the Jeffs (295 ozs. from 125 tons), the Peach A (306 ozs. from 160 tons), the Teutonic, the Woolley Dog (497 ozs. from 150 tons) were in evidence. In the Gwelo District, the Bell Reef recorded 1,823 ozs. from its 3,182 tons treated, and, good figures being furnished by the Globe and Phœnix and a number of smaller producers, the District total improved by over 2,500 ozs. The Hartley District total showed a small decrease, although somewhat improved figures were reported from the Cam and Motor property; in one or two directions here we learn of trouble from water shortage. Interesting items in the Lomagundi District total—especially so in view of the very successful dredging operations just over the Portuguese border—are the figures from the alluvial workers on the Angwa River. There was no noteworthy change in the Mazoe District figures, but the Salisbury District returns marked a substantial increase. The Shamva figures read: 46,787 tons crushed for a total yield of £28,561, while an official note explained that the plant, chiefly the zinc boxes, was still absorbing gold. The Umtali and Victoria Districts both registered small decreases for the month.

* * * *

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of June states:—The following is a summary of the Returns of Native Labourers employed on Southern Rhodesian mines during the months of April and May, 1914:

	April.	May.
Local	12,545	13,993
Portuguese Territory	6,912	6,956
N.W. Rhodesia	4,335	4,312
N.E. Rhodesia	5,389	5,557
Nyasaland	7,157	7,266
Other sources	891	937
	37,229	39,021

The number employed in May, 1914, shows an increase of 5,336 as compared with the same month of 1913. Increases are from all sources.

The Belgian Press contains some account of recent developments in the mining of the Congo. Cassiterite is the most abundant mineral in Lower and Middle Katanga, the deposits from a transversal zone extending S.W. and N.E. Up to the present the richest veins are in Bakat, near Muika; good veins have also been found at Kiambi on the Lukusi and near Muanga; also near Mulongo and along the Lukuga railway in the immediate vicinity of the Géomine coal beds. Just now the Muika mines produce ten tons of tin per month, which is sufficient to cover the cost. There are eleven Europeans and 450 natives employed. The cost of transport per ton of tin *via* the Congo to Antwerp is £10 2s. 6d. and bagging £8 more. It requires at least four months to transfer the tin ore from the mines to Antwerp, where it is sold for £140 per ton. Labour is abundant and cheap. The cassiterite is enclosed in granite courses in masses, nests, etc., associated with schists. If the three places at present worked prove remunerative, the falls of the River Luvua will be harnessed to furnish electric power to manipulate three or four monitors. It is estimated that each monitor will wash a thousand cubic metres daily and yield one ton of cassiterite. The existence of stanniferous alluvials over the basin of the Kouango in French Congo has been known since 1911.

Rhodesia Copper Co.

The statement of accounts is for the year ended May 31, 1914. The issued capital is £263,815, and at the date of the balance-sheet was approximately represented by: Cash, loans and debtors, less creditors, £45,760; quoted securities at market prices, £63,990; unquoted securities, £115.440; cattle and plant, £4,800; 449,600 acres of land and mining claims, as set out in the schedule attached hereto, £46,280; total, £276,270. At May 31, 1914, there were options outstanding on 189,887 shares at par. The investments held at date include £20,000 British Government, Egyptian and Chinese Stocks. £60,000 debentures and 12,500 B shares of 1s. each in the Rhodesian-Katanga Junction railway and mineral company, and 20,000 ordinary and two Founders shares of £1 each in the New Copley Collieries, also substantial interests in the Wankie Colliery, the Magadi Soda Company, and the Mount Oxide Mines. The income derived from investments during the period amounted to £7, 363. During the year several of the farms have been surveyed, and a large tract of country has been examined with a view to locating the remainder of the company's farm rights. Land aggregating 75,000 acres has been sold at a substantial profit, of which only £645 has been taken to the credit of the profit and loss account, the balance of profit being placed to the credit of land sales account. At May 31, 1914, the total area of land was about 449,600 acres. The company's representative in Rhodesia states that the prelimary survey of the Sinoia-Kafue railway has been completed. According to this survey, the proposed railway would bring the Kafue Bridge within 583 miles of Beira instead of 1,223 miles by the present route. He also advises that the district engineer and traffic manager of the railways recently inspected the Kafue River for some 250 miles above the bridge, and one or two stern-wheel steamers are to be put on the river as soon as possible for conveyance of passengers, grain, cattle and general stores. This should increase the value of all land along the Kafue River. Prospecting has been carried out with the object of following up the discoveries referred to in the last report, but without any important results. The profit and loss account for the year ended May 31, 1914, showed a credit balance of £9,035, and the directors recommend the payment of a dividend of 3 per cent., free of tax, for the year.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Mining Reforms.

To the Editor, *South African Mining Journal.*

Sir,—Kindly allow me to congratulate you and those responsible for the abolition of the old gelatine cheesa stick. I have always maintained, and I claim rightly, that the smothered gelatine was responsible for more deaths among the miners of the Rand than the dust itself. I have argued the point with my fellow-workmen by the hour; still, it was of no avail, the majority of working men want to be ruled by an iron hand. I have a record of twenty-one years behind me, and I can truthfully say that I never used a gelatine cheesa stick in my life, and I am, as far as I know, free from phthisis to-day. I have written you several letters in the past on this and other subjects, but during my absence in the Old Country several reforms that I formerly advocated have been carried out. I hope in the near future, with your permission, to write an article on the economical use of dynamite.—Yours, etc.,

W.

[illegible] United Main Reef.

Economics of Citrus Growing.

To the Editor, *South African Mining Journal.*

Sir,—In the S.A. *Mining Journals* of June 20, July 1, and July 25, I note with pleasure your remarks *re* citrus growing. I think, however, that you are not only too optimistic, but rather too premature. I personally have 6,000 trees, but I have yet to see a five-year-old tree giving me returns of 20s. for its oranges. Lemons were different even four years ago, and off one five-year-old Villa Franca lemon I got sufficient to net 63s., but let me point out that all trees are not alike; every tree planted does not necessarily live; some die, and what is more, some do not come away; do what you will they languish; these must be replanted. Then your spacing, 20 x 20, gives 108 to the acre, and not 100, but modern horticulturists agree that 25 x 25 is better spacing, and gives 140 to two acres. I am sure that off 10,000 trees, as stated by you, at five years of age, or even seven years, you will not get from all and every tree a return of 30s. If you take a conservative look at things, and put it down at 40s. for the two years, I'll agree with you.

I do not like "Economist's" figures at all. To plough and plant an acre for 15s. per acre is too cheap to be well done, what with clearing, levelling, ploughing, discing, etc., it can't be done at the price. His figures do not allow for breakwinds, which are absolutely indispensable, nor do they allow for headlands. Digging holes and planting at 3d. per hole—this again is too cheap to be well done. One figure he has not given, and that is, the cost of bringing water on to the land; furrows must be made, even though they are short. I consider that to prepare the ground and plant 10,000 trees will cost every bit of the £2,500 he allots for purchase price as well, for I'd like to write off 10 per cent. of deaths, which must be replanted, and your white man's salary for the first year. In fact, I consider that 10,000 trees at the end of the first year, together with the ground and water laid on, is at the least worth double that figure.

We know that the "fool of the family" is supposed to take up farming, but I do not agree that every fool will make an up-to-date farmer. If this is so, ask a novice for advice and avoid the expert. A miner is a miner, and not a farmer; let me assure you that the Utopia unlimited that "Economist" points out will be an unlimited failure. I know something of fruit culture, and let me assure your readers that it requires more than thews and sinews, more than brains—it requires experience. However, if any company is willing to put up the money for a really large venture in citrus raising, I am in a position to supply ground, water, and trees, to plant same with approved varieties, and to hand over same at any date five years from the commencement of agreement. The larger the better, 700 or 800 acres under citrus should give about 50,000 trees, which at £2 per tree per two years at five years of age should give a return of £50,000 per annum, and I do not see why trees at ten years of age should not return at least 800 fruits per annum, which at the low price of 2s. 6d. per hundred would still give £50,000 per annum. However, it will be many years before such a low price is obtained, and for the next twenty or thirty years 5s. per hundred would be a fair estimate. The value of an orchard giving 20s. per tree, working out at a basis of 5 per cent., would mean that the company's holding in trees alone would be worth £250,000. *Re* experts, Mr. R. A. Davis has a lot to do, and we cannot rely on him alone; there are others in the Transvaal, perhaps not so good, but more available than he is. Why not ask their advice? Most of these will give free advice. If I am one, I will be only too pleased to help the industry to the best of my ability.—I am, etc.,

T. S. WATKINSON.

Cairn, Nelspruit, July 27, 1914.

Brakpan Mines.

The Secretary gives us the following information in respect of the July, 1914, output:—Stamps working, 140; running time, 30 days; ore crushed, 57,280 tons; tube mills working, 9; ore hoisted, 64,624 tons; ore from dump, nil; waste sorted, 14,025; fine gold declared, 18,513·352 ozs.; value declared, £78,110, equal to 27s. 3d. per ton milled; working costs, £50,006, equal to 17s. 6d. per ton milled; working profit, £28,104, equal to 9s. 9d. per ton milled.

The Directors' quarterly report for the period ended 30th June, 1914, states inter alia:—Development Work.—The linear development for the quarter amounted to 5,978 feet, of which 4,418 feet were on reef, averaging 7·4 dwts. over a reef width of 38·4 inches. Of the footage on reef 1,688 feet were in payable areas and averaged 13·4 dwts. over 43·9 inches. Ore Treatment.—The following were the results obtained from reduction operations during the quarter:—Milling: Ore hoisted from mine, 170,404 tons; ore from surface dump, 5,920 tons; ore sent to crushing and sorting station, 176,324 tons; percentage of waste sorted out, 13·13 per cent.; average number of stamps running, 140 stamps; net running time, 79·880 days; ore milled, 151,950 tons; milling duty per stamp per 24 hours, 13.618 tons; yield in fine gold, 30.634 ozs.; yield per ton milled, in fine gold, 4.032 dwts. Cyaniding: Tons treated, 151,494 tons; yield in fine gold, 19,706 ozs.; yield per ton treated in fine gold, 2.602 dwts. Summary: Yield in fine gold, mill, 30,634 ozs. (4.032 dwts. per ton milled); Cyanide works, 19.706 ozs. (2.594 dwts. per ton milled); total, 50,340 ozs. (6.626 dwts. per ton milled). Working Expenditure and Revenue Account (tons milled, 151,950).—Total working costs, £144,963 18s. 4d. (19s. 0.965d. per ton milled); working profit carried down, £67,068 5s. 9d. (8s. 9.933d. per ton milled); revenue, £212,032 4s. 1d. (27s. 10.898d. per ton milled). Finance.—After providing for excess development, realised loss on the sale of Victoria Falls and Transvaal Power Company shares, Profits Tax and Dividend No. 5, the unappropriated profit at 30th June stood at £79,221, being an increase of £18,345 on the figure at 31st December, 1913. The capital expenditure incurred during the quarter amounted to £533, making a total of £1,866 for the six months ended 30th June, 1914. Against this there was a credit of £10,500 arising out of the sale of a portion of the company's holding of Victoria Falls and Transvaal Power Company shares.

The best "Reef Traveller" is the *South African Mining Journal.*

THE JULY OUTPUT: GROUP RETURNS.

Excellent Returns for a Short Month.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of July:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	60,100	16/ 8·6	17,535	£23,625
Geldenhuis Dp.	300	7	53,000	21/10·0	17,492	15,791
Nourse Mines .	260	7	52,800	19/ 7·8	16,527	17,703
Ferreira Deep .	280	7	62,160	16/10·7	25,533	54,895
Crown Mines ..	660	26	214,000	15/ 2·5	64,673	109,665
Durban Rood. D.	100	3	27,860	22/10·6	9,115	6,464
Totals & av'ges	1900	57	469,920	17/ 3·9	150,875	£228,143

The following are the results of crushing operations of Central Mining companies for the month of July:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B. ...	80	5	37,000	15/10.2	15,543	£36,094
New Modder ...	180	7	53,000	15/ 1·3	21,765	51,651
City Deep	150	9	43,600	21/ 6·5	19,364	33,697
Village Deep ..	180	7	53,000	17/ 1·4	18,228	31,340
Village M. Reef	160	6	34,100	16/11·8	14,777	33,138
Robinson	250	6	54,600	14/ 3·9	19,965	45,011
Bantjes Cons ..	100	3	22,850	21/ 3·2	7,045	5,300
Totals & av'ges	1100	43	298,150	17/ 0·5	116,687	£236,231

Barnato Group.

The results of operations of the Barnato Group for July are as follows:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.
Cons. Langlaagte	100	52,600	£65,786
Ginsberg	75	15,269	17,290
Glencairn	160	22,000	16,248
New Primrose	155	24,000	28,012
New Rietfontein	55	7,954	7,191
New Unified	60	13,390	14,528
Quest	35	4,896	3,071
Van Ryn Deep	80	14,420	70,729
Witwatersrand	210	47,910	52,990
July totals	930	232,439	£275,845
June totals	930	220,679	£272,562

Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Cons. Langlaagte	£37,841	14·388	£28,466
Ginsberg	13,896	18·201	3,545
Glencairn	13,379	12·163	3,024
New Primrose	15,138	12·615	13,170
New Rietfontein	6,612	16·626	804
New Unified	9,375	14·003	5,279
Quest	2,710	11·071	611
Van Ryn Deep	33,405	15·041	38,057
Witwatersrand	29,317	12·251	25,648
July totals	£161,703	13·914	£118,604
June totals	£161,714	14·656	£115,230

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of July, 1914, of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer & Jack ...	320	7	56,600	14,897	£27,119
Robinson Deep ...	130	10	54,860	17,282	29,497
Knights Deep	400	11	101,600	17,034	12,934
Simmer Deep	180	9	53,600	11,182	5,797
Sub-Nigel	25	1	5,345	2,373	2,489
Totals	1055	38	272,005	62,768	£77,836

Total gold in reserve:—Simmer and Jack, 500 ozs.; Robinson Deep, 2,366 ozs.; Simmer Deep, 1,832 ozs.; Sub Nigel, 780 ozs.; total, 5,478 ozs.

The sundry revenue included in the above total declared profit is as follows:—Simmer and Jack, £2,000; Robinson Deep, £864; Knights Deep, £2,305; Simmer Deep, £931; Sub Nigel, £224; total, £6,324.

Albu Group.

The following are the details of results regarding the July operations of the producing mines of the General Mining and Finance Corporation Group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,822	£13,999
Meyer and Charlton ...	75	15,073	13,091
New Goch	120	30,700	21,715
Roodepoort United	70	31,368	27,530
Van Ryn	140	39,800	29,155
West Rand Consolidated ..	100	26,500	26,381
	585	£158,263	£131,871

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	18/10·7	£18,517	£4,518
Meyer and Charlton	17/ 4·4	35,317	22,226
New Goch	14/ 1·7	32,853	11,138
Roodepoort United	17/ 6·6	29,000	1,470
Van Ryn	14/ 7·8	51,062	21,907
West Rand Consolidated ...	19/10·9	33,316	6,935
		£200,065	£68,194

Sakalava Madagascar Proprietary Oil Fields.

The secretary writes:—We have this day received the following cable from Mr. S. A. R. Skertchly, M.Inst.M.M., the resident engineer and geologist: "Number 2 well has reached a depth of 470 feet, formation now in, is bituminous sandstone."

The British Vice-Consul at Barcelona (Mr. G. M. Loly) reports that extensive deposits of sulphate of potassium and carbonate of potassium have been discovered near Cordona (40 miles north-west of Barcelona) as a result of investigations which have been carried out by important Belgian, Spanish, and German groups. The deposits are of great thickness, and begin about 200 feet below the surface. A Belgian company has paid £20,000 for a three months' option on the bulk of these deposits. Many claims for mining rights have been made to the Government, and the German Potash Syndicate has applied for large mining concessions; none, however, have yet been granted.

GRADE, COSTS, AND PROFITS IN JUNE.

Chamber of Mines' Analysis.

The following tabulation of the operations of the mines of the Transvaal contributing to the gold production is supplementary to the details published by the Chamber of Mines in its declaration on the 10th of the month.

THE WITWATERSRAND.

	Total value recovered	Value recovered per ton milled		Total working cost per ton milled		Total working costs	Working profit	Working profit per ton milled	
	£	s.	d.	s.	d.	£	£	s.	d.
1 Aurora West United	17,717	24	4	18	9	13,640	4,086	5	7
2. Bantjes Consolidated	28,639	26	1	21	4	23,478	4,915	4	6
3. Brakpan Mines	74,930	27	5	17	11	48,609	25,690	9	6
4 City Deep	82.865	39	5	22	5	46,174	34,288	16	8
5 City and Suburban	49,779	35	5	20	11	29,388	20,066	14	3
6 Cons. Langlaagte	66,940	25	5	15	0	39,587	27,351	10	5
7 Cons. Main Reef	38,879	32	0	20	3	24,436	13,934	11	7
8 Crown Mines	267,327	25	11	15	3	156,762	108,044	10	6
9 Durban Roodepoort	15,016	21	5	15	10	11,080	3,935	5	7
10 Durban Rood. Deep	39,975	30	3	24	0	31,730	7,854	5	11
11 East Rand Proprietary	232,852	27	9	19	2	155,041	67,622	8	5
12 Ferreira Deep	107,039	34	9	16	9	51,430	54,243	17	8
13 Geduld Proprietary	30,584	31	6	23	6	22,865	7,643	7	10
14 Geldenhuis Deep	72,016	27	8	22	1	57,467	13,862	5	4
15 Ginsberg	16 757	22	2	18	1	13 526	3,047	4	1
16 Glencairn Main Reef	15 751	13	10	12	1	12,664	2,268	2	2
17 Knight Central	22,900	21	7	20	10	22,017	603	0	7
18 Knights Deep	72.793	15	4	12	7	59,963	12,089	2	7
19 Langlaagte Estate	60,623	21	6	17	8	43,827	16.021	6	6
20 Luipaardsvlei Estate	19,514	22	0	18	2	16.011	3,277	3	8
21 Main Reef West	26.366	26	4	21	3	20,982	5,055	5	1
22 May Consolidated	9,706	13	10	13	2	9,187	493	0	8
23 Meyer and Charlton	35 651	48	6	17	3	12,689	22,888	31	1
24 Modderfontein B	63,206	33	11	15	11	27,195	35,435	20	9
25 New Goch	31,442	21	6	14	2	20,683	10,689	7	4
26 New Heriot	25.066	37	11	21	0	13.845	10,990	16	8
27 New Kleinfontein	69.548	27	9	18	3	45,713	23,079	9	2
28 New Modderfontein	97,999	38	1	15	1	38,799	58,374	22	8
29 New Primrose	27,113	23	0	12	9	14.875	11,969	10	3
30 New Rietfontein	7.234	20	1	18	11	6,574	614	1	9
31 New Unified	14,455	22	1	14	4	9,261	4,983	7	9
32 Nourse Mines	[illegible]	27	5	19	1	49.100	20.637	8	0
33 Princess Estate	[illegible]	26	1	24	2	25 699	2,047	1	11
34 Randfontein Central	246 696	23	3	16	7	175,544	70 260	6	8
35 Robinson	[illegible]	32	6	14	11	38,446	44,301	17	3
36 Robinson Deep	[illegible]	27	8	16	2	[illegible]	27,984	11	1
37 Roodepoort United	[illegible]	18	10	17	1	25,595	3,031	0	2
38 Rose Deep	77 219	25	1	17	0	52,293	24,248	7	11
39 Simmer and Jack	[illegible]	[illegible]	6	14	7	39,085	22,028	8	3
40 Simmer Deep	[illegible]	[illegible]	0	15	8	38,632	4.052	1	8
41 [illegible] Tribute†	5 892	19	2	—		—	—	—	
42 Van Ryn	[illegible]	25	[illegible]	15	6	29.604	21 249	11	2
43 Van Ryn Deep	[illegible]	33	1	16	3	34.658	35,928	16	10
44 Village Deep	[illegible]	29	1	16	[illegible]	43 598	[illegible]	12	[illegible]
45 Village Main Reef	[illegible]	[illegible]	11	17	6	28,251	[illegible]	17	1
46 Vogelstruis Estate	[illegible]	21	9	[illegible]	5	12 528	1 436	2	4
47 West Rand Central	[illegible]	[illegible]	3	26	1	3 222	637	5	2
48 West Rand Cons.	31 717	24	1	19	[illegible]	26 102	[illegible]	4	4
49. Witwatersrand	50,909	24	4	13	2	27,600	23,310	11	2
50. Witwatersrand Deep	57,026	25	0	15	7	38.816	21,223	9	6
51. Wolhuter	41,534	25	5	16	6	27,030	14,001	8	7
Miscellaneous producers	6,551	—		—		—	—	—	
Witwatersrand totals	2923425	26	5	17	1	1852071	1025629	9	5
†Private.				50 cos.		50 cos.	50 cos.	50 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

Heidelberg—									
1. Nigel	17,756	31	9	28	1	15,467	2,088	3	10
2. Sub Nigel	8,610	36	8	32	8	7,686	1,328	5	8
Barberton—									
3. Barrett	1.287	7	9	—		—	—	—	
4. Sheba	13,954	42	10	30	3	9,854	4,098	12	7
6. Worcester	4,604	15	0	12	6	3,850	730	2	4
Klerksdorp—									
6. Quest	2,867	12	0	11	0	2,476	392	1	8
Lydenburg—									
7. Ceylon Lydenburg	1,049	32	8	20	5	657	387	12	0
8. Glynn's Lydenburg	8,882	44	2	19	0	3,822	5,072	25	2
9. Transvaal G.M. Estates	43,437	59	11	22	1	15,986	26,918	37	2
Miscellaneous producers	26,687	—		—		—	—	—	
Total (outside districts)	126,133	36	10	23	0	59,798	41,013	15	9
				8 cos.		8 cos.		8 cos.	8 cos.
Grand totals	3049558	26	8	17	2	1911869	1066642	9	7
				58 cos.		58 cos.		58 cos.	58 cos.

A comparison of values recovered per ton milled with May shows that the value recovered on the Witwatersrand for May was 26s. 3d. and for June 26s. 6d. Working costs in June were 17s. 3d., in May 17s., in April 17s. 3d., in March 17s. 3d., in February 17s. 11d., in January 18s. 2d., in December 17s. 10d., in November 17s. 11d., in October 17s. 9d., in September 17s. 10d., in August 17s. 7d., in July 19s. 4d., and in June last year 17s. 8d.

For June last year the tonnage milled was 2,177,354 tons; for July, 1,873,930 tons; for August, 2,162,807 tons; for September, 2,035,318 tons; for October, 2,073,909 tons; for November, 1,995,573 tons; for December, 1,963,327 tons; for January of this year, 1,902,733 tons; for February, 1,861,442 tons; for March, 2,094,098 tons; for April, 2,075,561 tons; for May, 2,196,287 tons; and for June of this year, 2,178,161 tons. In the outside districts the total tonnage milled was 55,346 tons, making a total for the Transvaal of 2,233,507 tons.

MINING MEN AND MATTERS.

The Marquess of Worcester, Lieut.-Colonel the Hon. Everard Baring, Sir Charles Metcalfe, Mr. D. E. Brodie, and Captain Sewell have arrived by the Edinburgh Castle, on a visit to Rhodesia.

* * * *

It is notified that the Minister of Mines and Industries has been pleased to appoint the undermentioned to be members of the Miners' Phthisis Prevention Committee, namely: Messrs. John [illegible], Michael Huggins, Arthur James Wardill.

* * * *

It is notified that His Excellency the Officer Administering the Government, under the powers vested in him by Section 15 of the South Africa Act, 1909, has been pleased to approve of the appointment of Frederick Moss Blundell, Under-Secretary for Mines and Industries, as Acting Secretary for Mines and Industries, Acting Head of the Mines Department, Orange Free State Province, and Acting Commissioner of Mines, Natal Province, during the absence on leave of Herbert Warington Smyth, Secretary for Mines and Industries with effect as from the 11th July, 1914.

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Engineering Notes and News.

MINE RESCUE STATIONS RULES IN GREAT BRITAIN.—I.

Lessons for South Africa—Rescue Brigades and Ambulance Work.

WATH JOINT RESCUE STATION.

1. The instructor is in charge of the station and all rescue equipment, and is responsible for the proper training of all men connected with the station.

2. Members must not be less than 22 years of age, and must pass an examination by the station doctor, who will certify that the member is physically fit to wear the apparatus.

3. Every certified member of the rescue brigade must have a thorough knowledge of ambulance work.

4. All equipment must be kept ready for immediate use in case of emergency, and in order to avoid the possibility of any apparatus being disarranged, through indiscriminate or careless handling, no person shall be allowed to interfere with any part of the equipment at the station without authority from the instructor.

5. Members are not allowed to enter the equipment room unless for the purpose of receiving or returning their equipment.

6. Members attending the station for practice will report their arrival at the office, where their name must be entered in the attendance book by the instructor.

7. No person will be allowed inside the office, work room, or fan room during practice unless on business.

8. Persons outside must not converse with any man at practice in the gallery, or interfere with any door, window, or any switch connected with the electric light or fan.

9. All men, after entering the gallery for practice, must keep together as much as possible, and act in all ways as thought performing actual rescue work in a mine.

10. Members who experience any ill effects whilst wearing the apparatus in the gallery, must immediately withdraw, and at once report to the instructor.

11. When passing through the difficult and contracted parts of the gallery, members must proceed carefully, in order to prevent damage to the apparatus.

12. Members must comply with all orders given by their leaders, who must carefully note the condition of their men, and examine the pressure gauge of each man every 20 minutes during their period of work; and when any pressure gauge shows the minimum pressure fixed by the instructor the man must be withdrawn. In order that the interval of 20 minutes shall not be exceeded the leader must carry a watch.

13. The electric lamp shall always be used when at practice.

14. The dressing room and lockers are for the use of the members attending for practice; any article of clothing, etc., should be kept in the lockers.

15. The instructor shall enter the names and addresses of all certified members in the book kept at the station for the purpose. Any change of address must be notified to the instructor at the first opportunity.

16. All members must report to the instructor any serious illness they may have, and be subject to re-examination by the station doctor if the management committee deem it necessary.

17. A certified member is liable to be called on for rescue work at any of the subscribing collieries.

18. Each man will be paid £2 when he is fully qualified. To become fully qualified he must attend at least twelve practices and satisfy the committee of management that he is efficient.

19. Each certified member of the rescue brigade must attend once every three months and perform successfully a two hours' working test, for which he will receive 4s., plus travelling expenses.

20. The management committee have power to suspend any member whose behaviour at the station is unbefitting to the efficiency and discipline of the rescue brigade.

21. No visitors will be admitted to the station without a written or personal introduction from a member of the trustees or management committee, and must record their names in the book provided for the purpose

INSTRUCTIONS FOR LEADERS OF RESCUE PARTIES. WATH JOINT RESCUE STATION.

The leader of each rescue party will be appointed by the person in charge of the operations. He will take full charge and give all orders, and should travel first to show the way to his party. The leader will nominate one of the team to travel in rear of the party, who will report to the leader if any man feels any ill effects from wearing the apparatus, or is unable to keep up. He will also check the leader's gauge and will, if necessary, take over the duties of the leader. Before commencing work the leader will carefully inspect each man (fully equipped with oxygen turned on) to see that each apparatus is complete, working properly and all connections secure. He will examine each man's pressure gauge at least every 20 minutes and enter the time and contents on the gauge check, comparing with the previous reading to ascertain if the apparatus is working correctly. The team will work by the apparatus showing the least pressure returning when it shows the time required for the return journey, plus the 20 minutes margin which must always be left for safety. When both cylinders are turned on, the decrease in the number of pressures should be equal to the number of minutes elapsed since the last check. If any gauge shows an unusual decrease the leader will try the cocks of the cylinders to see if one has been turned off; should this be the case, the gauge will balance and show the correct reading; if this is not the case, the party must retire at once. At the same time as the gauge is checked the leader will examine each apparatus, paying special attention that the unions of the flexible tubes have not worked loose through the movement of the arms. He will also note the condition of each man, asking if he is all right; in the mouth breathing type this will be ascertained by signal, the leader raising his hand and the men repeating the signal if all right. If anyone feels ill effects, or if the leader at any time considers there is sufficient cause, he will withdraw his party. In the case of apparatus running out so quickly that there is danger of the wearer running short of oxygen before the return journey can be completed, the leader will travel behind the man, and by working the cocks of the oxygen cylinders will only allow the oxygen to enter apparatus intermittently, judging the periods by watching the gauge carefully. In this way the oxygen can be economised and the apparatus saved from running short. All pit practices should be carried out as if performing work of a serious nature, their object being to give the men confidence and experience of the behaviour and treatment of the apparatus under working conditions. The leader must travel slowly and pay attention to the rules for examination of gauges, etc. He must on no account rely on the instructor if he is present to do his work for him. In actual work, if the place where the apparatus is to be worn in some way in bye, it is desirable that the apparatus should be first fitted on and tested in a good light, say in the pit bottom or on the surface. The helmet can then be taken off, the rest of the apparatus being more easily carried when properly fitted. When doing actual work, the leader must first obtain all the information possible about the place before going into it and communicate his knowledge to his team. He must be careful to secure the road travelled so that there is always a clear return and to keep the officials informed of the progress made and difficulties to be contended with as fully and accurately as possible.

(To be continued.)

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This Department will invite tenders to careful specifications drawn up to comply with clients' requirements and ensuring their full protection. It will supervise the work during manufacture, and in every case, where possible, carry out all necessary tests on completion. It will see that materials are properly packed for safety in transit and with special regard to economy of freight.

Alternatively, this Department will undertake inspecting, etc., of plant and machinery, and reporting thereon.

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RONALD TRIST & CO., Ltd.,
CORONATION HOUSE, LLOYD'S AVENUE,
LONDON, ENGLAND.

Position of Anglo-German Tins, Ltd.

The directors' report submitted at the second annual general meeting, held on 24th July, 1914, is as follows:—"Your company is the owner of twelve (12) mining claims on the Farm Ongrugwena, situate near the town of Omaruru in German South West Africa. These claims were held under option during the year 1913 and have since become the property of the company by exercise of the option and payment of the purchase price, viz.: £10,000 to the late owners. No work was done on the original Dawib claims during the period under review, and the company's operations have been directed solely to exploration and mining on the Ongrugwena block of claims. During the year 1913 two tons of tin ore of an average grade of 25 per cent. metallic tin and 86 tons of concentrates of an average grade of 69 per cent. metallic tin was shipped. The nett proceeds of these shipments, as received from Europe, amounted to £10,661 16s. 7d. The 86 tons of concentrates realised a little over £123 per ton after deduction of freight and return charges. During the same year the company was very seriously hampered by the lack of cash capital, and towards the close of the year (1913) it became obvious that it could not provide for its pressing liabilities or discharge its obligations under the option contract. An extraordinary general meeting was held on 23rd December, 1913, when the position of the company was laid before the shareholders and an offer to tribute the claims for a period of one year from the 1st January, 1914, with the right of renewal for a further period of one year, was submitted for consideration. After having declined to subscribe any further capital, the meeting unanimously resolved to abandon all the original Dawib claims and to leave the matter of the offer to tribute in the hands of the directors to make the best arrangement possible. A tributing agreement was accordingly entered into with Wilhelm Weber, the consideration being the payment by the tributors of all the company's outstanding liabilities in German South West Africa at the end of the year, plus payment of the German Government royalty of 2 per cent. and a tributing royalty to this company of 7½ per cent. on the proceeds of all tin sold as returned by the smelters in Europe. This agreement is still in force and the tributors are actively working the claims. Advices show that 23 tons of concentrates were shipped in February and March, whilst at the end of May a further nine tons was bagged ready for shipment, but same was held against an anticipated rise in the price of tin."

An operation of an unusual character took place in the London money market in mail week, when there was placed a line of £100,000 two-year notes of Liebig's Extract of Meat Company. The notes bear interest at 5 per cent., and were placed at 98 per cent. The reasons for this course being adopted by Liebig's Company were that it has no debenture debt, and that the money was required only temporarily.

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Fraser & Chalmers.

The directors of Fraser & Chalmers, Ltd., have declared an interim dividend of 7½ per cent. on the Preference shares, less income tax.

Eldorado Banket.

The report of the Eldorado Banket Gold Mining Company, Ltd., presented at the meeting on the 22nd ult., for the year ended 31st March, 1914, states that the profits on the year's operations amounted to £66,087, which, added to the sum of £54,766 brought forward, makes a total standing to credit of profit and loss account at 31st March, 1914, of £120,853. Out of this the undermentioned dividends and the directors' percentage of profits have been paid, leaving a balance to be carried forward at 31st March, 1914, of £27,853. The depreciation for the year on machinery, plant, buildings, etc., amounting to £11,223, has been charged to reserve. The following dividends have been paid:—No. 11 of 15 per cent. (3s. per share) and No. 12 of 15 per cent. (3s. per share). A further interim dividend (No. 13) of 10 per cent. (2s. per share) in respect of the current year will be paid on 29th July, 1914. In order to avoid undue encroachment on the ore reserves it was decided from 1st July, 1913, to reduce the grade of ore milled to 8.0 dwts, the tonnage milled being maintained at 7,500 tons a month. Subsequently, from 1st January, 1914, it was resolved to reduce the tonnage crushed to 4,500 tons a month, and to increase the grade so as to maintain an average monthly profit of £4.000. The profits have consequently been reduced from an average of £10,213 per month for the previous year to £5,719 per month for the past twelve months. At the same time in order to equalise by development the amount of ore reserves crushed each month, it is necessary, so long as the parallel reef remains unpayable, to continue sinking the main shaft four levels in each year. The main shaft has been sunk 587 feet during the year—practically to the 4th level. This may be considered excellent progress, as the work had to be carried out in bad ground. During the past year the ninth and tenth levels, which had been opened up through winzes, have been connected with the main shaft, and the main reef opened up on the eleventh and twelfth levels. It is satisfactory to note that the pay chute on the eleventh and twelfth levels has increased both in length and width, and still maintains a high value. The parallel reef has shown more encouraging results in the crosscuts from the main reef at the twelfth level, though so far it has not proved payable. The reef on the thirteenth level was cut in April last, and according to the latest advices the pay chute, which has now been fully exposed, is 65 feet long, of an average value of 20.4 dwts over a width of 120 ins. The reef on this level has been cut out and the chute considerably shortened by the intrusion of a dyke, which the engineers advise will not affect the next level to the same extent, and the lower levels probably not at all. The ore reserves are estimated at 47,950 tons, of a value of 13.7 dwts. Since the reduction of the tonnage crushed monthly in January last, a satisfactory increase has been shown in the ore reserves. Major H. L. Sapte and Admiral Sir A. H. Markham retire under the articles of association, and being eligible offer themselves for re-election, and Mr. T. M. Thackthwaite has vacated his seat on the Board. Messrs. J. G. McDonald and G. Mitchell have been appointed local directors of the company in Rhodesia.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Aug. 10.—Jumpers (Special).
Sept. 1.—Jumpers (Special).
Sept. 9.—New Boksburg.
Sept. 11.—Swaziland Tin.
Sept. 18.—Transvaal G.M. Estates (annual).
Sept 25.—Sub Nigel; Simmer and Jack Proprietary (annual).
Sept. 29.—National Bank (Pretoria).
Oct. 28.—Rooiberg Minerals.

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Finance, Commerce, and Industries.

Commerce and the Co-operative Movement. In connection with various schemes for establishing new co-operative societies for the supply of goods to their members at cheaper rates than are now obtainable, that have been mooted of late, steps have been taken to draw the attention of the members of the Chambers of Commerce to a resolution recently adopted by the executives of the Pretoria and Johannesburg Chambers, viz.:—" That in the opinion of this Chamber it is not desirable that its members enter into any agreements with any co-operative association in South Africa or similar societies for the supply of good under ' special discount ' conditions."

* * * *

Lemco and Oxo. At the forty-ninth ordinary general meeting of Lemco and Oxo, held in London on the 8th ult., the Chairman, Mr. C. E. Gunther, pointed out that the value of cattle in the River Plate was abnormally high, owing to general scarcity caused by mortality and poor calving during previous years of drought. He said he considered the present high prices should stimulate stock raising to a much greater extent, seeing that the demand for meat must be expected to continue growing. The company already had a fair stock of cattle on their farms in Rhodesia, and the figures of increase showed promise of being very satisfactory. Attention was being given to the systematic improvement of the herds by introducing some of the best Angus and Sussex blood. During the past few years about 100 pedigree bulls and heifers had been sent out from this country. What Rhodesia now needed to further its development was better railway facilities, which would give it access and cheaper freight rates to its natural markets. During the past year the sales of the company's proprietary foods have been satisfactory. Oxo particularly had shown gratifying expansion, and had undoubtedly grown in popularity with all classes of the community.

* * * *

Supply of Sulphur to Farmers. Representations have been made to the Department of Agriculture by the Capetown Chamber of Commerce in regard to the supply of sulphur by the Government to the farming community for sheep dipping purposes. The department states that at the request of stock owners, who complained of the inadequate supply of dipping material and of the exorbitant prices charged by storekeepers for this commodity, depots for storing dipping material were established in different districts of the Cape Province several years ago. At Sutherland such a depot was established, and has been kept going ever since. It is intended to establish depots at convenient centres in the district within easy reach of the farmers, instead of the one in town. If, however, the storekeepers could satisfy the Government that an adequate supply of dipping material approved by the department will be stocked in outlying parts of the district, and sold at a reasonable figure, it may not be considered necessary to establish these depots. The sulphur is disposed of by the Government at cost price, plus cost of transport and railage, plus 2½ per cent. to cover incidental expenses. A commission of 6d. per bag sold is paid to the depot keeper, who renders a monthly statement of his sales. The Government does not desire to compete with private enterprise, but to eradicate scab, and to assist the farmer as much as possible to do so. Frequent complaints have been received from farmers in Sutherland and other districts of the insufficient supply of dipping material stocked by storekeepers, and that it very often happens that after travelling a long distance to obtain a supply when their stock is infected, or during simultaneous dipping, none could be obtained. In reply to these statements, the Management Committee has drawn the attention of the department to information received, which indicates that prior to Union the Cape Government abolished depots throughout this Province, and has inquired for further particulars of the reasons for their reinstatement. The committee has also asked for information of the names of the brands of sulphur supplied, and in respect thereof the cost to the Government, the actual price charged to the farming community, and the manner in which the difference between these amounts is arrived at. When these particulars have been received, the committee will pursue the matter further.

* * * *

Union Imports and Exports. The following are comparisons between the returns for the five months ended 31st May, 1914, and those for the corresponding period of 1913:—

IMPORTS.

	Increase £	Decrease. £
Animals, living	—	25,446
Apparel and Slops	—	48,329
Bags (coal and grain)	12,422	—
Cement	—	24,738
Cotton Manufactures	30,213	—
Electric Cable and Wire	—	30.013
Food and Drink (articles of)		
Butter	—	31,178
Cheese	—	8,035
Coffee, raw	—	78,178
Eggs	—	14,823
Fish (preserved)	—	29,746
Maize	—	91,414
Meats	—	58,793
Rice (including Paddy)	—	39,397
Sugar	13,101	—
Wheat	—	168,581
Wheaten Flour	—	76,550
Total—Articles of Food or drink	—	710,399
Furniture	—	25,050
Fencing Material	27,745	—
Haberdashery and Millinery	—	23,900
Implements, agricultural	21,062	—
Iron and Steel Manufacturers	—	87,360
Leather and leather goods	—	26,379
Machinery, agricultural	1,806	—
Machinery, electrical	81,125	—
Machinery, manufacturing	—	35,513
Machinery, mining	27,111	—
Manures and Fertilisers	12,907	—
Oils	72,813	—
Soap	—	9,815
Vehicles, bicycles	—	32,560
Vehicles (carts, carriages, etc.)	—	5,305
Vehicles (motor cars and parts)	78,275	—
Vehicles (motor bicycles and parts)	—	10,220
Wood and Timber	—	57,222
Woollen Manufactures	—	35,004

EXPORT.

	Increase £	Decrease. £
Bark	30,541	—
Coal	—	66,130
Copper Ore	191,175	—
Diamonds	—	1,540,444
Feathers, ostrich	—	416,555
Fish (dried and preserved)	13,604	—
Fruit, fresh	36,600	—
Gold, raw	—	2,122,583
Hair, Angora	66,254	—
Hides and Skins	—	129,824
Maize	116,418	—
Oil, whale	18,330	—
Tin Ore	69,946	—
Wool	89,238	—

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SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

Government Supplies.

The following is a summary of correspondence which has passed between the Johannesburg Chamber of Commerce and the Secretary, Department of Posts and Telegraphs, &c.:—

(a) From the Chamber (15th June):—"I have the honour, by direction, to inform you that it has been stated to my committee that your Department has sent a firm indent to the High Commissioner in London covering 50,000 light telegraph poles, and that it is an express instruction that no tenders shall be called for locally. It is unnecessary for my Committee to remind you of the assurances given from time to time by the Government that South African merchants would be given opportunities of tendering for the requirements of Government Departments, but in view of the definite nature of the statement made to my Committee, I am directed to ask if you will kindly inform this Chamber as to the actual position." (b) From the Secretary, Department of Posts and Telegraphs (20th June):—"Adverting to your letter of the 15th inst., relative to the placing of an order for fifty thousand poles with the High Commissioner in London, I have to state that the order in question was for twenty thousand poles of a particular type and that tenders are being invited in England from firms who have hitherto supplied this Department with similar poles at the lowest possible price. I shall, however, be glad if you will refer me to any recommendation expressly stating that tenders should not be called for locally in this particular instance. Thereafter the matter will be gone into farther." (c) From the Chamber (9th July):—"I am directed to thank you for your letter of 20th ultimo, which was submitted to my Committee at its last meeting. In reply, I am to point out that the second paragraph of your letter was practically answered by the admission in the first paragraph that the orders for twenty thousand poles were placed in England without opportunity being given to South African firms to tender. My Committee would submit that the usual practice should have been followed of obtaining simultaneous quotations in England and in this country, and that it is a hardship on firms established here to be shut out from competition. This is particularly so in the case in question, for the Chamber understands that the poles were of a recognised standard. My Chamber has been repeatedly assured by the Government that facilities would be afforded South African merchants and agents for tendering for the requirements of the several Departments of the Public Service, and I am directed to ask if you will kindly bring this correspondence to the notice of the Hon. the Minister in order that, if necessary, fresh instructions may be given in this regard."

* * * *

The Matabeleland Ranching Company and the Limpopo Ranching Company report further activity in the development of their respective estates by means of suitable buildings, irrigation works and erection of fencing. Notwithstanding the long drought experienced in Rhodesia progress has been satisfactory. The Matabeleland Ranching Co. holds 120,615 acres and the Limpopo Ranching Co. 77,262 acres.

Roberts Victor Diamonds.

The following are the results of operations of the above mine for the month of July, 1914:—Washed 16,863 loads, yielding 1,118 carats.

Frank Smith Diamonds.

The Secretaries write:—We are directed to advise you that owing to the political situation in Europe and the financial outlook, the Local Committee, after careful consideration, and with the concurrence of the London Board, has reluctantly decided that the best course in the company's interests is to temporarily shut down the mine until conditions warrant reopening. Operations, therefore, ceased on Saturday, the 1st inst., and suitable arrangements will be made for the caretaking of the plant and properties.

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Gold in Zululand.

A Maritzburg paper states that nuggets of gold, the size of walnuts, have been discovered at Nondweni, in Zululand. The nuggets were found by workmen while blasting for the foundations of a bridge over the river. Experts are proceeding to the spot, and further reports will be made.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—J. C. Williamson's Co.	8.15
Standard—Tiller Co.	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

THE NATIONAL BANK

of South Africa, Limited.

NOTICE is hereby given than an Extraordinary General Meeting of Shareholders of the above Bank will be held in the Board Room, of the Bank Buildings, Pretoria, Transvaal, on TUESDAY, the 29th SEPTEMBER, 1914, at 3 o'clock p.m., to consider and, if approved,, pass the following Resolutions:—

(1) That the Capital of the Bank be increased to £3,000,000 (Three million pounds) by the creation of 65,000 (Sixty-five thousand) Shares of £10 (Ten pounds) each, to be issued in such manner and upon such terms as the Directors shall from time to time determine."

The increase of Capital in respect to £500,000 (Five hundred thousand pounds is necessitated in view of the proposed purchase by this Bank of the undertaking and assets of The Natal Bank, Limited. A provisional agreement for purchase has been entered into subject to confirmation by the Shareholders in the last named Bank at a General Meeting to be held on 28th September, 1914.

In terms of the foregoing 50,000 (Fifty thousand) of these new shares will be placed at the disposal of The Natal Bank, Limited, for distribution among its Shareholders.

It is not contemplated to issue the balance of 15,000 (Fifteen thousand) shares out of the 65,000 (Sixty-five thousand) shares now in question, but the Directors ask Shareholders to give power to create these additional shares in case of the necessity arising in the future to utilize further capital, and thus avoid again calling Shareholders together for this purpose.

(2) "That Clause 67 of the Articles of Association be and is hereby altered and amended by substituting the word "fifteen" for the word "eleven" in line 2 thereof."

(3) "That Clause 77 of the Articles of Association be and is hereby cancelled, and that the following be and is hereby substituted in place thereof:

'At the first Ordinary General Meeting to be held in each year one-third of the Directors for the time being, or if their number is not a multiple of three then the number nearest to one-third, shall retire from Office.'"

The Head Office (South Africa) and the London Share Transfer Registers of the Bank will be closed from the 31st August to the 4th September, 1914, both days inclusive.

Attention is drawn to the following:—Holders of Share Warrants to Bearer are entitled to vote by proxy. Such Shareholders desiring to be present or represented at the Meeting must deposit their Share Warrants at the places and within the times stated below:—

(a) At the Head Office of the Bank in Pretoria, at least Three Days before the day fixed for the Meeting.

(b) At any of the Branches of the Bank in South Africa, at least Eight Days before the Meeting.

(c) At the London Office of the Bank, Circus Place, London Wall, E.C.
(d) At the Credit Mobilier Francais, 30 and 32, Rue Taitbout, Paris.
(e) At the Deutsche Bank, Berlin.
(f) At the Rotterdamsche Bankvereeniging, Amsterdam.
} At least Thirty Days before the Meeting.

The instrument appointing a Proxy must be deposited at the Office in Pretoria not less than 48 hours before the time fixed for the Meeting at which the person named in such instrument purposes to vote.

By Order of the Board of Directors,
C. P. MATHEWS,
Secretary

Pretoria, 29th July, 1914.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

CONTENTS. PAGE

Notes and News 613

Topics of the Week:

- The Progress of Events 615
- Rand "Safety First" Campaign 615
- The Dominions Commission on Rand Problems 616

The War and the Further East Rand 617

Economic Possibilities of German East Africa ... 617

The July Output 619

Progress on Barnato Mines 620

Mining Men and Matters 620

The Exudation of Nitro-Glycerine 621

Rhodesian Section:

- Latest Mining News 622

The Development of South African Resources 623

Engineering Notes and News 625

The Economic Use of Workmen on the Rand—IV. 625

Automobile Notes 627

Finance, Commerce and Industries 628

Notes and News.

German Mines in Africa.

Some topical interest is lent to this issue by the references to the mineral possibilities of German South-West Africa. The Otavi copper and lead mines are, of course, the chief, indeed the only, ones of their kind in the South-West colony. In addition, a small tin property belonging to the Anglo-German Tin Company of Johannesburg is being worked by tributors. The diamonds of the south-west coast have not, strictly speaking, to be mined for, and the mode of their occurrence is well known. In German East Africa an auriferous tract undoubtedly exists, and at least one gold mine is producing.

* * * *

Universal Danger Signal.

The "Safety First" Committee of the Rand Mutual Assurance Company have commended to the Council of the Mine Managers' Association the desirability of having a signal which everyone will use universally, instead of the number of different ones now in use. The skull and cross bones is one sign, the word "Danger" in red is another, while a hand holding a bunch of lightning signifies danger from electricity. Now, in America, a sign has been largely adopted, viz., "Danger" in a red oval, surrounded by black, but, more largely, a plain red circle or ball is in use, with no lettering and easy to make (*vide* United States Steel Corporation's Bulletin No. 3, of August, 1912, and American Iron and Steel Institute's Bulletin of January, 1913). The red circle was recommended by the American delegate to the International Conference for the Prevention of Accidents at Milan in 1912 and has been adopted by the American Iron and Steel Institute, the National Metal Trades Association, and the National Association of Manufacturers (all American).

* * * *

Payment of Half-Yearly Dividends.

At the instance of the Government the Chairman of the Stock Exchange went to Pretoria on Wednesday to discuss the question of the non-payment of the half-yearly dividends by the mining companies, owing to present abnormal monetary conditions. The Government made a confidential communication regarding financial arrangements it is at the moment endeavouring to make. The completion of these arrangements will be notified to the Chairman. At the suggestion of the Government, the Chairman will advise his committee, pending receipt of such notification, to refrain from taking legal proceedings. The Chairman believes that the result of the Government's efforts will be to render unnecessary any extraordinary delay in the payment of the dividends. This statement is issued to the Exchange and Press with the approval of the Government.

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The Price of T.G.M.E.'s.

Speaking at the London meeting of the T.G.M.E. in mail week, the Chairman, Mr. C. Pakeman, said that a month or so ago the London office had received several inquiries from shareholders as to the reason why the market price of the shares was so low—namely, about 1⅞. They were able to reply that they had received no disquieting news whatever regarding the company's mines, and were totally unable to explain the vagaries of the market, although they reminded the inquirers of the general depression which had for so long affected all classes of securities. "Of course," he added, "where mines had not the regular formation of those in the Witwatersrand district, a higher return was looked for to compensate for the greater uncertainty; but, even allowing for this, the price certainly seemed to be unduly depressed when they considered that the present ore reserves represented, roughly, 26s. per share in sight, and that for many years past they had maintained approximately the same amount of reserves ahead of their batteries. This left only some 11s. 6d. per share, which surely was a very moderate valuation to place upon the future development of their existing mines and the great speculative possibilities awaiting development, not to speak of the other assets figuring in the balance sheet." In the course of some discussion satisfaction was expressed with the management of the mines and with the results achieved; and, in reply to a reference made by Mr. A. V. Neville to the market price of the shares, the Chairman stated that anything he had said must not be taken as an attempt to put a price on the shares.

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The Messina Co. and the War.

Despite the closure of the metal markets and the chaos prevailing in Europe, the Messina Company is proceeding with normal mining and milling operations, and is moreover shipping ore. A considerable tonnage of rich concentrates was in fact despatched from Delagoa Bay the other day, consigned of course to a British port. For last month the company's mill ran 26·4 days and treated 6,844 tons, being at the rate of 260 tons per day. The total production was, concentrates 1,134·96 tons of a value of 40·4 per cent. copper, matte 77 tons of value 56·7 per cent. The total production is thus 1,211·96 tons, value 41·5 per cent. The total value would appear to be about £24,000 based on a price of £57 5s. for standard copper, the last quotation cabled to South Africa before the metal markets were closed. Development for the month was 371 feet. This announcement is most satisfactory and reassuring. At the present South Africa can ill afford to lose any productive industries, and although no one can tell in these troublous time what the near future may hold it is decidedly encouraging to learn that at present at any rate the Messina mine is productive and working at normal capacity. The reports regarding the proposed curtailment or cessation of work at the tin mines have doubtless given rise to the idea that the Messina Company is also about to close down or at the least restrict operations, and the panic of last week certainly lent substantiation to the view that the copper industry of the extreme Northern Transvaal would have to cease. It is hardly conceivable that if the war in Europe is a protracted struggle the company can avoid feeling, and feeling severely, the confusion and partial paralysis of the world's trade. But at the moment it is, as we have already stated, eminently gratifying to know that the Messina Company is continuing normal operations and is moreover shipping copper. The shipment is insured at a war risk of 2 per cent., and it reflects the more secure feeling evidently obtaining in well-informed circles that whereas last week the company could obtain no war risk rate, no difficulty has now been experienced in obtaining the moderate quotation referred to above.

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Lord Harris on Rhodesia.

Lord Harris made a very cheerful speech in mid-week at the annual meeting of the Gold Fields Rhodesian Development Co., Ltd. The Rhodesian market has certainly suffered severely from depreciation, but, as his lordship pointed out, while full publicity and attention have been bestowed on any adversity which has befallen the country, no corresponding allowance has been made for the excellent and steady work accomplished on the mines, either already producing or on the eve of production. Lord Harris assured shareholders that the ore had not run away, and that the properties had to-day the same intrinsic value as when the market put them at a much higher figure. Signs are not lacking that the depreciation has been very much overdone. Thanks to the energy which during the year was infused into mining operations, shareholders in the Gold Fields Rhodesian Company are to-day very much nearer the fruition of their hopes than was the case a year ago. The company is largely interested in mining properties which are rapidly approaching the period of crushing; some, indeed, are already contributing to the country's monthly gold output. The Shamva plant is working satisfactorily and results seem likely to exceed all estimates. It was calculated working costs would amount to 8s. 6d. As a matter of fact, they are no more than 7s. 6d. The extraction was estimated at 85 per cent. It actually works out at from 92 to 94 per cent., and it is hoped the Shamva Company will be able to distribute on an average something like 40 per cent.

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Otavi's Copper Production.

English holders of the shares in the Otavi Company have recently been presented with the annual report of that German South-West African undertaking. It is of interest to take note that the production of metals secured by the company in respect of its South-West African operations continues to expand. Owing to the larger amount of ore shipments and of ore dealt with in the year to March 31, 1914, than in the previous year, the adverse effect of a severe decline in the price of copper was overcome and an increase in profits secured. Hence an increase in the rate of the dividend declared. The profits, from mining operations and working the railway for the Government, for each of the last three years are set out below:—1912, £134,188; 1913, £191,015; 1914, £208,310. The company's mining operations are conducted in the main at the Tsumeb deposit, where at first the ore was obtained by opencut, but where for some time past it has been secured by ordinary mining operations of shaft and driving. The mine has now been opened upon to the fifth level. At this level development work has proved the ore bodies to be considerably more extensive than at the fourth level and the grade in no way inferior in quality to that in the higher levels. The main shaft has been put down to the sixth level, and there commencement of driving has been started. Exploring below the fifth level by two boreholes and a winze has ascertained continuity of ore in depth with lead and copper contents. The shaft is to be continued down to the seventh level. Erection of plant for concentration of ore, also screening and picking, has been going on, and such plant will come into operation shortly. The procedure of the company is to effect shipments of the rich ore, also locally concentrate and smelt low-grade material.

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Langlaagte Estate.

In the quarter ended June the development footage driven, risen and sunk was 5,779 linear feet, and 28,010 cubic feet. The ore reserves at 31st December, 1913, were 1,512,359 tons. Depletion, January-June, 1914, less development, 20,965 tons; total ore reserves at 30th June, 1914, 1,491,394 tons. Ore mined, January-June, 1914, 288,998 tons; waste rock sorted out on surface, nil; milled, 288,998 tons. The machinery and plant remain in good order, and the water supply is sufficient. Labour is described as not equal to requirements.

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Randfontein Central.

In the quarter ended June 30 at Randfontein Central the expenditure on capital account was as follows:—Shafts, etc., £91,168; underground plant, £14,551; surface plant, £22,182; general buildings, £1,622; sundries, £534; total, £130,359. Development footage driven risen and sunk was 52,032½ linear feet and 248,455 cubic feet. The ore reserves at 31st December, 1913, were 8,635,610 tons; development, January-June, 1914 (less depletion), 9,389 tons; total ore reserves at 30th June, 1914, 8,644,999 tons. Ore mined, January-June, 1914, 1,269,407 tons; waste rock sorted out (=6·72 per cent.), 85,245 tons; milled 1,184,162 tons. Machinery and plant remain in good order. Water supply is abundant. In regard to labour, the native labour position did not improve during the last quarter of the period, the influx just balancing the wastage. The supply is therefore not equal to requirements.

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Village Deep's Prospects.

The results secured by the Village Deep mine during the June quarter again show improvement. The working profit was £88,291, costs being 16s. 9d. per ton. The tonnage milled increased 17,500 tons to 151,600, which represents approximately the full capacity of the plant. The yield was a trifle higher owing to closer sorting, and working costs have been appreciably lower, resulting in a great improvement in profit. Development work has progressed with improving reef disclosures. Capital expenditure (new construction) for the quarter amounted to £1,755, mainly in connection with No. 3 shaft, underground and surface equipment of engines. The amount still authorised, but unexpended, is £19,254. The mine is producing higher profits with a considerably lower unskilled labour force than in the corresponding period of 1913. Claim property account has been increased by an amount of £7,000, representing the purchase of two claims and a water-right on Farm Turffontein No. 19, from the Salisbury Gold Mining Co., Ltd. (in liquidation). It was desirable to purchase these claims (which are situate within this company's area), in order to enable development work in the lowest levels in the eastern section of the mine to proceed unhampered. The purchase consideration of £7,000 is not payable until 30th April, 1916.

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Union Miniere du Haut Katanga.

In the report for 1913 it is stated that the year offers a particular interest, in so far as it marks the entrance of the Union Minière upon a new phase—that of industrial working properly so called. Star of the Congo.—The ore extracted in 1913 gave, after sorting and washing, 50,000 tons of smelting ore. Since the arrival of the railway (June, 1913), while working on a reduced scale, important development work has been started at the Kambove mine. The material necessary for the equipment of the mine is in transit; intensive working by means of open cuttings and steam shovels, although somewhat delayed, will be able to begin about the commencement of 1915. For six months' working in 1913 the ore extracted after sorting gave 11,000 tons of smelting ore. The prospecting and mining work at Luushia, begun in 1913, have been hindered by lack of labour. However, having been entrusted to contractors, the mining has produced 20,000 tons of ore, a large proportion of which has had to be briquetted. Metallurgical Work.—From 2,404 tons of bar copper and 88 tons of matte, containing respectively 95 per cent. and 65 per cent. of copper in 1912, the production passed for 1913 to 7,245 tons of bar containing 95 per cent. to 96 per cent. independently of 162 tons of matte containing 68 per cent. The two batteries, each of 22 coke ovens, supplied with washed coal from Wankies, have been working simultaneously since March, 1914; they produce 3,000 tons monthly of good metallurgical coke, thus fulfilling expectations.

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Natal Coal and the War.

One of the immediate effects of a big war (remarks the *Natal Witness*) is the dislocation of the trade and commerce of the world. To the countries actually engaged as the belligerent parties this dislocation amounts to a paralysis, while right through to near and distant markets the shock is felt in its varying intensity, and an almost universal depression sets in as a result of the disturbance. In the present instance, the normal interchange of commodities between Great Britain and her customers outside the affected area is partially restricted, and with the high insurance rates ruling, in consequence of the great risk in transport, there is a proportionate rise in the cost of such commodities. Food, for instance, will be dearer so long as the shadow of war hangs over the great producing countries of Europe, and the cost of certain staple, raw and manufactured materials will be similarly affected. A drastic import tax could not be more effectual. Mr. D. C. Dick, a well-known local contractor, in a conversation with a representative of the *Witness*, expressed himself as wholly optimistic on the subject of the war. As a business man conversant with our staple industries, and particularly that of coal-mining, Mr. Dick was asked what effect the war would have on local production, as to coal, whether there would be an increased outside demand on our fields. "Undoubtedly," replied Mr. Dick, "and I am prepared to guarantee that our industries will develop more during twelve months of war than they would in ten years of peace."

TOPICS OF THE WEEK.

THE PROGRESS OF EVENTS.

Despite the dearth of war news, the economic outlook continues to improve. The Rand mining industry is pursuing the even tenour of its way unchecked, and there is no reason to fear any serious interruption of its operations. All dangers of a shortage of the necessaries of life are now regarded as at an end and the action of the British Government in regard to war risk rates and the insurance of the trade routes of the world has produced an excellent effect. Conditions in this country may be expected to return to the normal, though the process must be slow in view of the unprecedented seriousness of the upheaval. The unemployment caused by the closing down of the diamond mines and the delay in payment of mining dividends are the most direct evil consequences of the crisis. We do not profess to be in the confidence of those responsible for these drastic steps, but we do believe that good and sufficient reasons have actuated them. The Union Government appears to be doing everything that prudent statesmanship can dictate to lessen the blow to South Africa, and we can go forward to face the big issues of the struggle confident that eventually all will come right.

RAND "SAFETY FIRST" CAMPAIGN.

In contrast to the picture of Europe plunged in war, the "Safety First" campaign against accidents on the mines of the Rand continues unabated. Since last we wrote about the progress of the movement, there is evidence of increasing activity on the part of the Prevention of Accidents Committee of the Rand Mutual Assurance Company. At the outset that Committee very wisely secured the hearty goodwill and co-operation of the Association of Mine Managers in the movement, as it was recognised that only by enlisting the active sympathy, and indeed the enthusiasm, of managers that any really good work could be done. The Committee were naturally desirous to avoid it being thought that the Committee arrogated to itself the function of instructing managers in their work, but at the same time wished to reach every manager and make the experience of one available and serviceable to all. For that reason a joint Conference between the Council of the Mine Managers Association and the Committee of the Rand Mutual Assurance Company to discuss the whole subject is being arranged. Another tangible proof of the activity of the Committee lies before us in the shape of a useful digest of the mining regulations. This booklet has been got out by the Prevention of Accidents Committee of the Mutual Assurance Company with considerable care, setting out under different headings those regulations affecting the ganger and miner on Witwatersrand gold mines; together with those that apply to onsetters and banksmen. The work is intended as a free issue to all underground employees, including onsetters and banksmen, and steps are being taken to ensure that each of these workers receives a copy. On the front page it is announced that the Minister of Mines has been pleased to allow this booklet to be regarded as an authorised abstract of the regulations in terms of Regulation 175 (1) and its possession by any of the aforementioned workers will therefore be a sufficient compliance with that regulation. The Prevention of Accidents Committee earnestly commend this book to workers for careful study, and hope that its issue will enable them more clearly to understand their duties as laid down by the regulations and so assist in reducing accidents. The Committee have asked the advice of the Mine Managers as to whether there is any large number of workers who would only be able to fully understand the book if it is printed in Dutch; if the number of such workers justifies it, the Committee are prepared to consider having a Dutch translation issued. A glance at the work shows that it is thoroughly well done. No one who has attempted seriously to digest the mining regulations but has felt the need of some such guide and handbook. The arrangement is simple and effective, the digest most thoroughly done and the whole so "fool-proof" as to amply justify the description of "regulations without tears." Mr. [illegible], Chief Inspector of Mines, contributes a brief but practical and most valuable preface, and the index and cross index further enhance the usefulness of the work. The booklet is substantially bound in red cloth, is finished in convenient pocket-book shape, and provides a valuable vade mecum for the miner. As showing the spirit in which it has been prepared and issued, we may quote from the introduction:—

"This booklet is compiled especially for underground workers, and consists of those regulations which are applicable to you, with marginal notes explaining shortly what you are required to do and not to do. The marginal notes are to make the regulations clear to you, but it is the regulations themselves that you are by law bound to observe; these are printed in full on the right hand page. Every care has been taken to include all matters referring to your particular duties and responsibilities. In order to assist you there is a table of contents and an index, and the regulations are arranged in headings according to the different classes of work. Please be particular to read and study carefully all that applies to the work you have to do. [illegible] know or understand all that the law requires of you. Workers must understand that the law is made to ensure the safety of themselves and of their fellows, and it is a duty which every man owes to his fellow workers to see that these rules and instructions are strictly carried out by himself and by others. Your employer does not require you to do anything forbidden by these regulations, but, on the contrary, wishes you to carry them out fully. Don't take unnecessary risks. Do your work the safe way. It pays you and it pays your employer to avoid accidents. Look after your health."

In addition, the Committee have reprinted a series of lectures by Mr. A. M. [illegible], Deputy Inspector of Mines, Krugersdorp, delivered in May last on the West Rand, and entitled (1) Fall of Rock; (2) Explosives; (3) Miscellaneous Mine Accidents, Shaft Accidents and Accidents Due to Carelessness, Negligence and Inexperience. The Committee have decided that these should be circulated amongst mine workers on the Rand, irrespective of whether such workers are insured by the Rand Mutual Assurance Company or not, "in the hope that it will serve to reduce the number of accidents on these fields and so help along the 'Safety First' movement."

THE DOMINIONS COMMISSION ON RAND PROBLEMS.

It is hoped that the extracts from the interim report of the Dominions Royal Commission, printed in our last issue, do justice to that valuable and interesting document. It will be seen at once that the conclusions reached and recommendations made are, as anticipated, considerably qualified in the interim text as compared with the cabled summary. Apart from the summing up in favour of the general amalgamation idea, and in advocacy of the introduction of a world-wide authority on mining questions, there is little to cavil at in the recommendations. As a fact, many of them should prove very helpful, and will doubtless command the serious attention of the industry. In regard to labour questions the report is particularly suggestive and informing. With a view to remedying the unrest and inefficiency of the workers, the South African Economic Commission recommended the abolition of the contract system and the substitution of a fixed daily wage or a premium or bonus scheme. But the Dominions Commissioners [illegible] the root causes [illegible] deeper. They say:—

> It has been suggested [illegible] where [illegible] native labour [illegible] under white supervision that the essential rule is to pay natives only under [illegible] and to avoid the danger of the abuse of authority by [illegible] of [illegible]. In all cases where large numbers of such natives [illegible] have been placed in authority [illegible] have been [illegible]. The obvious conclusion is that, [illegible] it is essential that the [illegible] should be of a high class, and that they should be more carefully selected. . . . By restricting the white overseership to a select number of men, carefully trained and of high class, better wages could be paid to the individual and the creation of bodies of capable and expert supervisors and miners could be secured. We believe that progress towards efficiency would be found in the better remuneration of the more capable white man, provided that the numbers so employed are restricted to those who are worthy to be placed in charge of responsible work and who have the necessary qualities to make efficient supervisors of native labour. It goes without saying that in the above observations we mean by better remuneration better effective wages, attainable not only by higher rates but by improved conditions, better health, and cheaper cost of living.

The Dominions Commission is not much impressed with the native labour recruiting system. It is admitted to be superior to what it was a few years ago. "But even now," they say, "the plan in force must attract severe criticism." They add:—

> The amount spent on recruiting adds some 11 per cent. to the total wages bill for native labour. If applied to those recruited the expenses per head amount to 6d. per shift, equivalent to from 20 to 25 per cent. of the wages paid. We should be curious to know whether in the old days of the press-gang and the crimping house these proportions had been exceeded, or whether any other system of recruiting can involve the assistance of one European recruiter for every five labourers recruited each month.

The Commissioners criticise the "maximum average" system, which prescribes the average rate of wages of natives engaged in certain occupations. The effect is to restrict the daily wage which a skilful or industrious native is able to earn by his toil. The Economic Commission already referred to declared it to be undesirable that barriers should be placed in the way of non-white labour to prevent their advancement to any kind of work for which they were capable. "With this conclusion," say the Dominions Commission, "we cordially agree." They also recommend that "experiments in the establishment of native locations for families where practicable might well go hand in hand with similar experiments in the introduction of the closed compound system in replacement of the present open compopnd." In respect of this matter of the regulation of native labour the Commissioners make some comparisons of the systems in operation at the diamond mines at Kimberley and the gold mines at the Rand, very much to the disadvantage of the latter. The problems of both white and native labour have been "boldly attacked and partially solved" by the De Beers and Premier diamond administrations, and this experience is said to encourage the hope that the similar problems at Johannesburg will not be found insoluble. So far labour unrest has not disturbed the relations between the employers and the white employees at Kimberley, many of whom have been in the employ of the De Beers Company for thirty years, and "have attained an almost official dignity of demeanour!" As regards native labour, the Commission found a similarly satisfactory state of affairs at the diamond mines. There was no "maximum average" to discourage the efficient native. Wise and liberal management of the closed compound placed the native in a secure position, and he appreciated the privilege of purchasing his own rations. Not the least valuable portion of the report is that in which the value of the mining industry to the State is demonstrated. In the present crisis the importance to South Africa of keeping the industry going cannot, of course, be over emphasised.

Union Mint. The Government has decided on the temporary re-opening of the Pretoria Mint for the coining of South African gold sovereigns and half-sovereigns. Work is already proceeding in connection with the overhauling of the plant and equipment, and minting operations will be commenced as soon as possible. The Government's decision is the outcome of a desire to ensure that under the circumstances, should the supply of gold specie now in the Union fall below local requirements—the gold specie now in the country is sufficient for the Union's needs for a considerable time to come, but it is desirable to make arrangements to supplement existing gold supplies in case there should occur a scarcity, of which, happily, there is at present no sign or indication.

THE WAR AND THE FURTHER EAST RAND.

How the Financial Position May Affect the Immediate Prospect of Activity.

The great European war cannot but have some influence on projected operations in the Further East Rand area. As was announced some time ago, the Government has recently had under consideration the drafting of new regulations under which the working of the several mining areas on the Further East Rand, the rights of disposal of which are vested in the Government, would be made a more attractive proposition than hitherto. It will be recalled that some time after the flotation of the Government Gold Mining Areas Company to work the State leases on Modderfontein, it was announced that the mining rights of the Brakpan, Schapenrust and Witpoort areas were offered to prospective tenderers. The invitations elicited no response. The terms were then altered and made more favourable for tenderers, but again no business resulted. Within the past few months, however, the subject of these leases has been reconsidered, and we understand that had not the present *impasse* in Europe disorganised all the money markets of the world, an important statement on the matter would very shortly have been made. As it is, however, it is most improbable that anything will be done in this matter for some time to come, certainly not until the financial situation in Europe approaches the normal again.

Another point worthy of comment in this connection is that the New Modderfontein Company has for some time past been considering additions to crushing capacity. In view of the excellent developments that have recently taken place in this property, such additions would appear to be thoroughly warranted, and in the ordinary course of events a declaration of a policy of expansion of operations might have been shortly expected. But under present conditions such a course is clearly out of the question. The Further East Rand will then have to wait until more normal conditions obtain, but it should be appreciated that these developments which would augment the activity of the gold industry to a very substantial degree have by no means been abandoned. They have merely been postponed, and it is ardently hoped that the time is not far distant when they will be considered again.

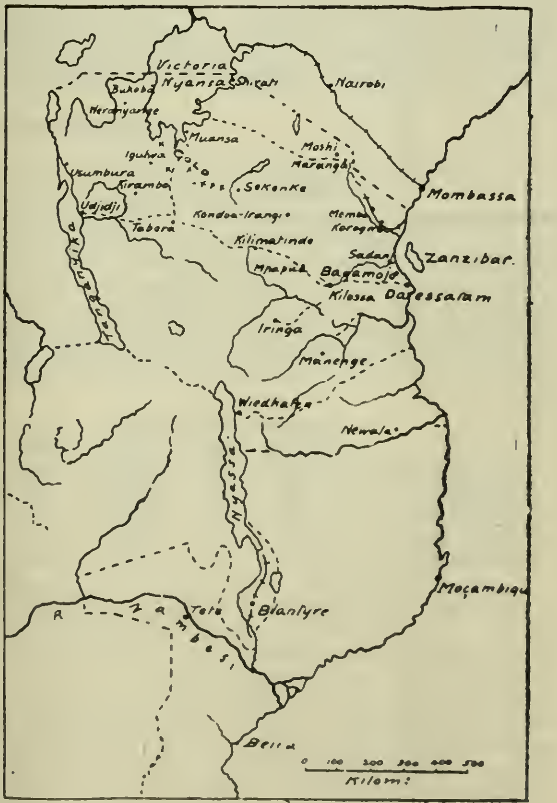
ECONOMIC POSSIBILITIES OF GERMAN EAST AFRICA.

Railways and Gold Deposits—The International Exhibition Abandoned.

The second general German East African exhibition, which was to have been opened at Dar-es-Salaam this week, and which promised to be a very interesting affair indeed, has very naturally been abandoned on account of the war. The exhibition was to have been opened by the German Crown Prince and would doubtless have attracted the attention of numerous visitors from South Africa. Although the project of holding this national exhibit of the products, etc., of the German East African Colony has been abandoned, a special measure of interest at present attaches to that country and indeed to all the other German Colonies in Africa. German East Africa is a territory comprising 384,000 square miles, with a native population estimated at about 7,000,000. From an Imperial and British point of view the principal point of interest in the country is its geographical position. Sandwiched between North-Eastern Rhodesia and British East Africa, it has always constituted a barrier to the fulfilment of that great Imperial project of Cecil John Rhodes, namely, the construction of an all-red railway route running through British territory from Capetown to Cairo.

German East Africa owns at the present moment two railways, the Usambara railway in the north, and the Tanganyika railway which, starting from Dar-es-Salaam, cuts the colony into two approximate halves. Both railways were originally intended as short pioneer lines, and the Usambara railway remains as such to the present day. The end-station of the line is at the foot of Kilimanjaro, and visitors are thus enabled to journey thither to admire the beauties of this mountainous region. But the inhabitants in that part of the colony wish the railway to be prolonged, and their efforts are directed to obtain the extension of the system to Lake Victoria. The arguments in favour of the prolongation claim that new districts will be opened up for the settler—districts as healthy and as high up in the hills as those to be found in British East Africa. It is also claimed that by the continuation of the railway in question a considerable part of the trade done with the Lake Victoria district will be diverted from the Uganda railway, which is unable to cope with the traffic, to a port in German East Africa.

Opposed to the above scheme, the essence of which is to tap Lake Victoria by means of the prolongation of the Usambara railway, is another scheme which favours the tapping of the same region by a branch line leaving the Tanganyika railway. Opinions as to which scheme is the better for the colony differ considerably, but they are by no means limited to those defending the local interests of either Tanga or Dar-es-Salaam. Many prominent colonials who



Sketch Map of German East Africa, showing Gold Occurrences.

cannot be accused of examining the question through coloured spectacles, differ as to which would be the most advantageous line from a broadly economic point of view.

Lake Tanganyika was reached this year by the German railway. The Belgian railway (Lukuga) is also practically at the lake. When both these railways have been constructed and a steamer service has been organised on the lake, the journey across Africa from east to west, or from west to east, considered less than ten years ago to be one of the most perilous journeys in the world, will have been reduced to a trip not exceeding fourteen days in length.

Regarding the extension of the German railway system to Lake Nyassa, the third of the great equatorial lakes of Central Africa, nothing definite is known, though it must be admitted that the exploitation of a railway in this direction is fraught with exceptional possibilities. It was originally intended to run a line from Lindi, or from the beautiful natural harbour of Kilwa-Kisiwani, to Lake Nyassa, but apparently the scheme has been dropped in view of the sterile tracts of land which would have had to be crossed before the productive shores of the lake had been reached. But a branch line from the Tanganyika railway, somewhere between Ngerengere and Kilossa, or a main line from Dar-es-Salaam, would tap the rich river lands of the Rufiji, as well as the healthy and productive plateaux of Mahenge or Iringa, and thus reach the no less fertile fields of Neu-Langenburg on Lake Nyassa. However, when all is said and done, it will be impossible for these railways to open up all the fertile districts of German East Africa unless they are worked in connection with roads acting as feeders, and unless a low rate policy, in harmony with the economic possibilities of the settlers, is introduced by the Government.

Rand mining men, lately returned from German East Africa, speak very highly of the mineral possibilities of that country. Mr. H. Loret, well-known as an ex-mine manager on the Rand, visited the country some time ago on behalf of the German East African Syndicate, and some extracts from a report by him appeared in a recent issue. It is an open secret that the property he was originally sent to report upon proved unattractive, but that he was able to peg off for his syndicate certain gold-bearing claims of a greater promise. Another ex-Randite, Mr. Jeffries, some time ago returned from a long and adventurous prospecting trip through the same territory, speaks even more favourably of its many possibilities. The railway from Dar-es-Salaam to the Lake traverses a wonderful country of rubber, copper and tobacco plantations. Mr. Jeffries declares the country is traversed by a well-defined gold-bearing belt; and the accompanying sketch made by us from an official map kindly lent by him, shows the position of the several reported gold discoveries. No geological survey has, however, been made, and the value of the discoveries can only be guessed at. Gold is not the only mineral found, as tin, copper and mica have been traced. The Sekenke Gold Mine is producing and paying dividends. Mr. Jeffries speaks enthusiastically of its prospects, the value at 500 feet vertical being over 2 ozs. per ton. *Water and Fuel.*—Water is abundant. During the dry season most of these rivers are partially dry or water stands in big pools, but by digging five or six feet in the sand, running clear water will be obtained, and this method is adopted by the natives for watering thousands of cattle. In many parts very fine mining timber, chiefly acacias, can be had for the price of cutting it down. *Native Labour.*—As the country is thickly populated, and boys are to be had from 5s. to 8s. per month, inclusive of food, no difficulty will arise on this point for many years to come. At the Sekenke Mine and at Lassama Mr. Loret has seen the natives working underground, and was told that these natives take very kindly to mining and have no fear of going underground. *Climate.*—The biggest part of the German East African hinterland is a high plateau, about 4,000 feet above sea level, resembling the rolling plains of the Transvaal, and in some parts a copy of Southern Rhodesia. The nights are rather cold, and the heat during the day is not oppressive; in fact, malaria is very little known, and the plateau is considered healthy.

Shamva Report.

If the showing made by the report of the Shamva Mines for 1913 does not in all respects confirm the expectations held in the early days of the company's history, neither does it on the other hand lend support to the pessimistic views more recently expressed in some quarters. Of course, so far as the ultimate outlook is concerned, much depends upon the fourth level, at which only a comparatively small amount of work has yet been carried out. We tabulate in concise form the salient features of development at the different levels:—

	Length of Ore Shoot.	Aver. Width.	Tonnage Developed.	Value.
Prospect level	740	88	296,659	3·77
First level	920	110	738,853	3·71
Second level	820	97	787,607	5·78
Third level	510	29	440,193	6·13
Fourth level	160	62	142,481	5·57

The ore taken credit for at the fourth level represents the [illegible] between the crosscuts at the foot of winzes Nos. 72 and 73. At this horizon the lode has recently been opened up by driving, the width indicated being 25 feet of the average value of 4·25 dwts. The fact that winze No. 72, in its continuation below the No. 4 level, so far discloses erratic values is not altogether reassuring. Underground work having been restricted, the ore reserves are no more than 142,500 tons up on the year at 2,406,000 tons; the value of 5·01 dwts. shows a small improvement. As bearing upon the results of crushing, it should be noted that the value of the ore mined during the first three months of 1914 was only 3·83 dwts. An encouraging feature is that costs for May, including 1s. for development redemption and another 1s. for general expenses (including Government royalty), averaged only 7s. 6d., or 1s. below Mr. Piper's original estimate, and a further reduction is considered possible. The estimated profit of 7s. 6d. per ton would, on a 50,000-ton output, give £210,000 per annum. Dividends of 30 per cent. would call for £180,000. The present cash deficiency of £54,000 is expected to be met out of revenue by September.

Glynn's Lydenburg.

The profit from working operations at Glynn's Lydenburg, Ltd., for July is estimated at £1,562.

An interim dividend of 10 per cent. (2s. per share) has been declared by the Board for the half-year ending 31st July, 1914, payable to all shareholders registered in the books of the company at the close of business on the 31st July, 1914.

Princess Estate and G.M. Co.

Directors' report for the quarter ended 30th June, 1914:—Working expenditure, £79.142 19s. 8d. (£1 3s. 11.4d. per ton); balance: Working profit, £6,145 14s. 4d.; sundry revenue, £524 11s. 4d., total, £6.670 5s. 8d. Revenue. £85.813 5s. 4d. (£1 5s. 11.6d. per ton). In the above return no allowance is made for the Government Tax on profits. The footage driven, risen and sunk on the reef and sampled was as follows: South Reef, 900 feet, averaging 8.4 dwts. over 25 ins.; Main Reef, 425 feet, averaging 4.95 dwts. over 45.55 ins. It is estimated that the payable ore (based on the milling width) developed by the above footage is: South Reef, 30.527 tons; Main Reef, 8,700 tons; total, 39.227 tons. These figures are subject to re-calculation at the end of the year, when block values are made out. A decrease in the native labour force employed during the quarter has to be recorded, and taking this into consideration, the tonnage milled, yield and working costs have been of a satisfactory character. When compared with the previous quarter, working costs show a small reduction, the recovery value per ton was about the same, the ore crushed was less by 800 tons and the working profit shows an increase of £744. Preparatory work in connection with stoping in the West Deep Section is progressing. The No. 2 vertical shaft will shortly be completed to the 8th level, thus relieving the No. 1 vertical, which then can be completed to the 13th or deepest level.

THE JULY OUTPUT.

Group Profits Analysed—Earnings and Costs Last Month.

THE gold output of the Transvaal for July has been declared at 732,485 ozs., valued at £3,111,398. This constitutes an increase of 14,559 ozs. or in value £61,840 as compared with June, but in this connection it should of course be borne in mind that last month contained one more working day than the preceding month. The average daily yield in July was in point of fact less than that for June. The Rand shows an increase of 14,904 ozs. of a value of £63,306, but the output of the outside districts was less by £1,466. In our last issue we gave particulars of the profits, etc., earned by some of the groups. These figures are now supplemented by figures for the other controlling corporations. The premier mining corporations, Rand Mines, Ltd., and Central Mining and Investment Corporation, both under Corner House control, show a combined profit of £464,374, made up as follows:—

Rand Mines	£236,231
Central Mining	228,143
	£464,374

The June results were:

Rand Mines	£229,090
Central Mining	239,717
	£468,807

Of the Rand Mines subsidiaries the principal increases in profit were as under:

	June.		July.
Geldenhuis Deep ...	£13,862	......	£15,791
Ferreira Deep ...	60,042	......	54,895
Crown Mines ...	108,015	......	109,665

The Rose Deep's costs were reduced to 16s. 7d. during the month. The profit of the Nourse Mines shows a decline from £20,612 to £17,703.

As to the Central Mining companies, the Modder B's profit at £36,094 is a little better than the June declaration, but the New Modderfontein's return is substantially less, £51,651 as against £58,291. The City Deep's profit is nearly £2,000 less, although costs were reduced by nearly 1s. per ton. The Village Deep, Village Main Reef, Robinson and Bantjes all show fair increases.

In regard to Neumann properties, a most satisfactory improvement is to be noted in the Knight Central returns, the profit having risen from £603 to £3,536. The Wit. Deep's profit is about £500 less and that of the Wolhuter is nearly £1,000 less. Profit for the group is £55,665 as compared with £54,814.

The five producing mines under the control of the Consolidated Gold Fields of South Africa—four on the Rand and one in the Nigel area—show a profit of £77,836, which is a substantially better result than was secured in June, when £71,849 was earned. All companies show good improvements—the Simmer and Jack from £24,862 to £27,119, the Robinson Deep from £28,378 to £29,497, the Knights Deep from £12,445 to £12,931, the Simmer Deep from £4,603 to £5,797, and the Sub Nigel from £1,561 to £2,489. The stamps at work numbered the same in each month, but the quantity of ore crushed was 272,005 tons as compared with 253,030. The Knights Deep, which milled 95,100 tons in June, crushed 101,600 tons in July.

The Goerz group shows a profit of £9,107 as compared with £11,036 in the preceding month. The earnings of the May Consolidated, which of course is now approaching exhaustion, and of the Princess Estate at £557 and £2,274 respectively, are very much the same as in the previous month. Geduld, on the other hand, shows a fairly noticeable decline—from £8,181 to £6,276. The working costs of this company were unduly high owing to abnormal repair work completed during the month.

The following are the salient figures:—

Total output	732,485 ozs.
Value	£3,111,398
Increase	14,559 ozs.
Value	£61,840
Witwatersrand	703,136 ozs.
Value	£2,986,731
Increase	14,904 ozs.
Value	£63,306
Outside districts...	29,349 ozs.
Value	£124,667
Decrease	345 ozs.
Value	£1,466
Total stamps	9,798
Decrease	5
Witwatersrand	9,295
Increase	30
Outside districts...	503
Decrease	35

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	44,910	£55,346	£20,700
Wolhuter	32,100	40,416	13,084
Consolidated Main Reef...	24,910	38,774	12,796
Main Reef West	21,010	28,097	5,549
Knight Central	26,480	28,950	3,536
Total for Group ...		£191,583	£55,665

Goerz Group.

The profits of the crushing mines of the Goerz group for July are as follows: May Consolidated, £557; Princess Estate, £2,274; Geduld Proprietary, £6,276; total, £9,107.

Robinson Group.

The profits of the Robinson group for July are as follow: Langlaagte Estate, £16,200; Randfontein Central, £72,000.

Luipaardsvlei Estate.

The following is the result of operations for the month ended 31st July, 1914:—60 stamps ran 29·541 days, crushing 19,120 tons, yielding 1,620 ozs. fine gold. 3 tube mills ran 18·251 days and 2 tube mills ran 11·823 days, yielding 1,307 ozs. fine gold. Sands treated, 12,085 tons, yielding 1,202 ozs. fine gold; slimes treated, 7,035 tons, yielding 553 ozs. fine gold. Profit from operations, £2,333. Profit from accumulated slimes, £11; sundry revenue, £900; total profit, £3,244; working costs, 18s. 1½d. per ton.

Nigel G.M. Co.

The returns from this company's mine for the month of July are as follows:—Gold recovered, 1,181 fine ozs.; profit, £1,370; stamps working, 75; value of gold, £17,772. The grade was slightly lower. There was increased development. Some of the plant was under repair during the month. Water position unchanged.

Sheba G.M. Co.

The following are the results of mining operations of the Sheba for the month of July, 1914:—"Crushings for the month: Mill ran 29 days, crushed 7,090 tons, yielding 3,096 ozs.; estimated profit, £3,272."

PROGRESS ON BARNATO MINES.

Improved Position of the Van Ryn Deep, Witwatersrand, New Rietfontein and State Areas.

Progress at Barnato mines is reflected in the batch of quarterly reports for the three months ended June 30, issued this week. At the Modderfontein Government Areas the ore reserves were recalculated at the end of June, stoping operations at the north shafts having shown that the stoping width will be greater than originally estimated, owing to the disclosure of hanging wall leaders not exposed in development work. The payable ore reserves at the end of June were estimated to amount to 1,785,000 milling tons of an average assay value of 6·13 dwts. The Allis-Chalmers 26in. by 60in. steam hoist at the north-west shaft was completed during the quarter, and the 20in. by 60in. hoist at the south-east shaft was practically completed. The headgear bins, sidings, etc., at the north-west shaft are complete. The sidings at the south-west shaft are complete, and the ore bins at both the south west and south-east shafts are nearly completed. Excellent progress was made with the erection of the reduction works, and it is hoped that the mine will be able to start crushing sometime in November.

At the "Knights" the gross profit was £5,618 more than that for the previous quarter. This improvement was brought about by an increase of 2,770 tons in the quantity of ore milled, a reduction of sevenpence per ton in the working costs, and a slightly higher grade. The south incline shaft was sunk 258 feet, and has reached a distance of 538 feet from the bottom of the vertical shaft. At the end of the quarter the incline was in reef assaying 7·3 dwts. over 51 inches. The main winze connecting the northern incline with the vertical shaft was sunk 190 feet, and the connecting pass from the vertical was advanced 207 feet. Development values continued satisfactory, and the payable ore reserves were increased by 20,991 milling tons.

At the Van Ryn Deep the quantity of ore milled was increased by 20,490 tons as compared with the previous quarter. Working costs showed the substantial reduction of 1s. 11d. per ton, and as the grade was maintained there was an increase in the gross profit of £27,611. Good progress was made both as regards shaft sinking and development. The east incline shaft was sunk 138 feet, and has reached a distance of 865 feet below the sixth level, and a total distance of 2,794 feet. The west incline shaft was sunk 163 feet to a total inclined depth of 3,222 feet. The driving of the seventh level from the west shaft was commenced, and the crosscut east intersected the reef at a distance of 41 feet from the shaft. The drive has been extended for a length of 45 feet in a well-defined body of reef carrying high values. Development in other sections of the mine continues satisfactory, and the payable ore reserves were augmented during the quarter by 8,460 tons. It will be noted that 12,365 tons of ore were taken from the dump during the quarter. Of this quantity 10,043 tons were taken in April and May, and in June the ore drawn from this source amounted to only 2,322 tons.

At the New Unified there was an increase of 900 tons in the quantity of ore crushed as compared with the previous quarter, and working costs were further reduced by ·889 shilling per ton. A greater percentage of ore was drawn from the Main Reef and South Reef, with a corresponding reduction in the quantity of Main Reef Leader mined. Although this caused a reduction in the grade, the lower cost of working more than compensated for the drop, and the gross profit was higher than that for the previous quarter by £535. The driving of the 14th level on the South Reef was commenced during the quarter, and reef of good value has been exposed. Elsewhere development results have also proved satisfactory.

At the New Rietfontein the results for the quarter show a considerable improvement on those for the preceding three months. Working costs have been reduced by 2s. 9d. per ton, and although there was a slight lowering of the grade the working profit was increased by £2,270. Arrangements have been made to treat a small quantity of accumulated slime which remains on the property, and it is hoped that some profit will be derived from this source. A certain amount of development is being carried on, but as this is more in the nature of prospecting work no credit has been taken for it in the ore reserves. Of the ore sent to the mill, 12,337 tons were obtained from reclamation, and the ore reserves were depleted by 8,467 tons.

At the New Primrose the fall in the grade of the ore mined which was experienced during the first quarter of the year continued to affect results during April and May, but a slight improvement was noticeable in June. The quantity of ore milled was 900 tons below that for the previous quarter, and the recovery value also was less by about sixpence per ton. In addition to this the profit from treatment of accumulated slime was lower by £896, so that in the aggregate the gross profit was reduced by £3,695, as compared with the profit for the previous three months. The slime accumulations are almost exhausted, and very little further revenue from this source is anticipated.

At the Glencairn working costs showed a further reduction of threepence per ton, and as the quantity of ore milled was 3,173 tons more than that crushed during the previous quarter the gross profit was increased by £914. The treatment of accumulated slime continues to provide a steady source of revenue, although the quantity dealt with was slightly reduced owing to the colder weather necessitating a longer period of treatment. No ore was developed, but of the quantity milled 38,181 tons were obtained from reclamation and other sources, and the ascertained ore reserves were depleted by 25,010 tons.

At the Ginsberg there was an increase of 1,100 tons in the quantity of ore crushed, and working costs were reduced by over fourpence per ton. Unfortunately, the grade of the ore mined showed a further drop, and the revenue from gold was decreased by 1s. 1d. per ton. As a result the gross profit was less than that for the previous quarter by £1,991. Recently there has been indications of an improvement in the grade, and it is hoped that somewhat better results will be obtained during the ensuing quarter.

MINING MEN AND MATTERS.

Amongst the French reservists who left for the war this week were M. [illegible] and M. S. [illegible], both well known in mining circles.

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The monthly meeting of the Chemical, Metallurgical and Mining Society will be held this evening. [illegible] will deliver his presidential address.

• • • •

The knighthood recently conferred on Dr. T. K. Rose, the chemist of the Royal Mint, has gratified his many friends in South Africa and those known to the whole metallurgical profession. Sir Thomas is an A.R.S.M., D.Sc. (Lond.), F.C.S., Vice-President I.M.M., Honorary Member Chemical, Metallurgical and Mining Society of South Africa. Since 1902 he has been chemist and assayer of the Royal Mint. He is the author of "Metallurgy of Gold" and of various metallurgical papers read before the Chemical Society, the Royal Society, the Institute of Mining and Metallurgy, etc.

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THE EXUDATION OF NITRO-GLYCERINE.

Some Important Points Elucidated and Dangers Explained.

[By Mr. Wm. Cullen.]*

In the following notes where exudation is referred to, it means the exudation of nitro-glycerine from gelatinous explosives, of which there are a great many types on the market. Blasting gelatine is, however, the one in most common use, and no other will be referred to. Blasting gelatine, as the name indicates, is a gelatinous plastic body made by dissolving collcdion cotton (soluble nitrated cellulose) in nitro glycerine. The plasticity or stiffness depends in the main on the percentage of collodion cotton present; the higher the percentage the tougher the product and the lower the percentage the "flabbier." In practice this percentage is somewhere between 7 and 8, and if the latter figure is exceeded the gelatine tends to become insensitive. The "quality" of the collodion cotton has a great influence on the power of the gelatine to retain nitro-glycerine, and exudation is frequently the result of the use of bad quality collodion cotton. To overcome this tendency the percentage is generally raised, but, as has just been said, this may lead to insensitiveness. Again, if the percentage is cut too fine exudation will almost certainly follow, and this is the most common cause of exudation on these fields. If blasting gelatine is kept any length of time, say six months under local conditions, exudation is certain to start, and as time goes on it increases rapidly. Nearly all blasting gelatine shows slight exudation at the fold of the wrapper, but if confined to this part it does no harm. Pressure, be it ever so slight, gradually forces nitro-glycerine out of gelatine, and this explains why the bottom cartridges of a packet generally show worse exudation than the top ones. This is particularly marked in the 1¼in. size, as the bottom cartridges have to bear quite a heavy overhead weight. This incidentally explains why the bottom cartridges are frequently misshapen. Neither of the foregoing effects are nearly so marked with the ⅞in. size as the pressure is more equally distributed throughout the mass. In order to avoid exudation and bad shape it is therefore best to store the case so that the cartridges are at right angles to the plane of the magazine floor. The point, however, is of little practical importance here, as explosives are as a rule only a few days, and at most two weeks, in a magazine. Heat causes exudation, so that other things being equal gelatine will keep better in winter than in summer. A hot and badly ventilated magazine is therefore bad for the storage of gelatine; what is worse is the alternation of heat and cold, conditions which cannot well be avoided in this country except in the case of underground magazines, which, however, frequently suffers from other disabilities. Exudation is also caused by vibration which is merely another way of applying pressure, so that a long journey by road or rail, particularly under the conditions referred to in the previous paragraph, is bad. The nature of the wrapper also affects exudation. When there is bad exudation the surface of the cartridge and the interior surface of the wrapper will be smeared with nitro-glycerine. When it is very bad, nitro-glycerine will be found on the outer surface of the wrapper and gelatine in this state should never be used. That it is used, not infrequently, in this state cannot be denied, and the writer is convinced that this is the cause of many mysterious accidents during the charging up of holes. Gelatine which shows distinct exudation is dangerous, no matter how much care may be exercised in handling it. There remains now to be considered the conditions under which exuding blasting gelatine may cause a mishap.

Charging up of Holes.

No matter how true a hole is drilled it always contains plenty of gritty material, and in this connection the writer of these notes has a very strong prejudice against copper sheathed tamping rods. In his opinion only hard wood ones ought to be used for all nitro-glycerine explosive. At some stage or other during the process of charging pressure has to be applied to the cartridge by the tamping rod, so there is a triple combination of pressure, grit and nitro-glycerine, which is truly a most favourable one for causing an explosion. It is a very common practice to break the primer cartridge across its shorter axis about the middle and insert the detonator at that point. In the light of what has just been said this is highly dangerous, besides being against the law. It has been stated that this is sometimes done with the second or even the third cartridge which is a still more reprehensible practice, but the writer has never seen this himself. The cartridge wrapper should never be disturbed except for inserting the fuse and detonator in the manner prescribed by regulation.

Detonating the Bottom Cartridges First.

This practice is recommended by many and, provided fuse of the best quality is used, it is well worth a trial. The idea is to make the bottom cartridge the primer cartridge and thus start the detonation from the bottom of the hole. By this procedure it is thought that there would be less chance of getting unexploded cartridges. If indifferent fuse is used a combustion and not a detonation may take place, with the consequent production of the very worst gases, but there is another possibility. Badly exuding gelatine may smear the sides of the hole with a skin of nitro-glycerine, a broken cartridge may even smear it with gelatine itself, so that there would be actually in the hole a "train" of the quickest. In other words there is probably in this combination the conditions for making a so-called running fuse. There are, of course, other possibilities, but the two outlined are the principal ones. Many "old timers" liked "watery" gelatine because it was "quick" and "certain," but nowadays no one who values his life should ever use it.

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Directors in Court.

ISSUING FALSE BALANCE SHEETS?

The case against the directors of the African Finance Corporation, Limited, and the West Rand United, Limited, was commenced in Pretoria this week. The case was held in the Supreme Court owing to the large number of exhibits in the case. The accused directors are Henry Jules Meyer and Petrus Verheyeren, the former being defended by Mr. Blacklock of Johannesburg, and Verheyeren by Mr. Reitz. The case was heard before Mr. P. H. Richards, A.R.M., Mr. A. Stanford prosecuting. Mr. Stanford intimated to the Court that another accused would appear in the case. He outlined the case at great length, mentioning that among the charges against accused were those of theft by conversion and issuing false balance sheets, which involved a large amount of money. He said that certain things had been put down as asests which were not assets, and went on to specify certain items and detailing how the money had been spent. Mr. Orr, the auditor, then commenced on his evidence, which is expected to take some considerable time.

ANSWERS TO CORRESPONDENTS.

A number of letters and replies to correspondents are held over.

Rhodesian Section.

LATEST MINING NEWS.

The War and the Mines—Giant South—Copper Ore Rates—The Empress Mine.

In commenting on the European war and its possible effects on the mining industry in Rhodesia, the *Rhodesian Mining Review* states:—"We take it for granted that the local managers of companies directed from abroad will soon receive instructions, if they have not already received them, to curtail purely development operations at once. So that plainly, with the Stock Exchanges closed down, and with the impossibility of converting securities into cash, the necessary funds to carry on cannot be furnished. Crushing operations now in progress will naturally, of course, be carried on as long as the necessary mine stores hold out. But here is the crux. There are only limited quantities of dynamite and cyanide, to take only two out of the many items, in the country, or in South Africa. And it is clear that, with shipping facilities completely disorganised, no reliance can be placed for an indefinite time upon the hope of fresh supplies from over the water. Even so far as dynamite goes, it has to be remembered that such manufacturers of this as there are in South Africa depend entirely for certain essential ingredients on supplies from oversea; while cyanide, drill steel and many other necessaries are drawn exclusively from abroad. It is probable too that mines will soon be affected by the almost certain rise that will take place in the foodstuffs, etc., that have to be supplied to the native workers, and in a variety of other ways it is clear that many difficulties and disabilities will presently have to be faced. The outlook then as there is no disguising it—an exceedingly gloomy one from the point of view of the mining industry, and all that remains for those engaged in it to do is to make what preparations in advance that are possible. Fortunately they have had at least a few days warning, and some have been able to take advantage of it. For the rest, we can only watch events with what patience we are capable of, and trust in England's success."

* * * *

A cablegram received last week from the head to the London office of the Giant Mines of Rhodesia stated:—"Giant Mine: Small stoppage [illegible] due to [illegible] in main shaft. Giant South: Erection of necessary plant and headgear nearly completed; prospecting already commenced."

* * * *

A Chronicle correspondent writes from Gwelo on freight rates for copper:—"A recent occurrence shows the attitude of the railway authorities towards the small worker in Rhodesia. A small copper proposition has recently been opened up in the Lower Gwelo district and sample lots of ore have been shipped to Europe for treatment. For conveying the ore from Gwelo to Beira the freight charged was £6 5s. 0d. per ton, whereas the chrome ore from the Selukwe Mine is carried at the rate of 1d. per ton per mile, which works out at approximately £1 per ton for the same distance. The rate charged on the copper quite prohibits further shipments being made, as the percentage of copper is not high. I understand that the authorities have been approached, and for the benefit of the whole country it is to be hoped they will consent to carry copper ore at a reasonable rate, especially as most of the freight trains from Gwelo to Beira consist of empty trucks."

* * * *

Extensive additions are being made to the Empress mine plant, Victoria, Mashonaland. In connection with this, the [illegible] Metal Works, Ltd., has been preparing for the erection of six treatment vats complete, with filter gratings and pipes, and six tanks ranging from 10 ft. to 20 ft. diameter, and a seven compartment extractor box with gratings. The whole of the materials, about 12,000 lbs. weight, are being prepared in Bulawayo, and will be conveyed by rail to Victoria and by wagon to the mine, which is situated some 30 miles from Victoria. Workmen will be sent from Bulawayo to complete the erection at the mine.

Rezende Mines.

Results for the month of July, 1914 are as follows:—Estimated profit. Central Section, £2,160; old west workings and Penhalonga Sections, £718; total, £2,878.

Lomah (Rhodesia) Exploration.

The report of the Lomah (Rhodesia) Exploration, Ltd., covering the period from the incorporation of the company to 28th February, 1914, states that the authorised capital is £75,000, divided into 300,000 shares of 5s. each, of which 258,448 shares are allotted, leaving 41,552 shares for future issue. Development work during the period covered by the report has been chiefly confined to the Kambanje mine, situated in the Enterprise Schist district. This mine has been further equipped with additional boiler power and pumping plant, and the new vertical main shaft to open up the main reef has been completed to the No. 3 level. Half-yearly and other reports issued to the shareholders have dealt fully with progress of operations to date. Cable news was recently received announcing that the main reef had been cut at the No. 3 level (240 feet vertical), the assays at the point of intersection being 15 dwts gold over 18 ins. on the west side of the crosscut, and 11 dwts gold over 28 ins. on the east side. Further reports are awaited from the consulting engineer. It is satisfactory to report that developments generally have been decidedly encouraging. The main reef carries good gold values down to the No. 3 level, and the value of the property has been thereby further enhanced. It is interesting to record that prior to the acquisition of the mine by this company former owners raised and milled 1,680 tons of ore, which yielded 1,069 ozs. gold, equal to an extraction of 12.72 dwts gold per ton.

Eileen Alannah.

The report of the Eileen Alannah Mining Company, Ltd., for the year ended 31st December, 1913, to be presented to the meeting on the 27th instant, shows:—Cash £1.150 and debtors £26,628; creditors £4,198. The issued capital is the same as at the date of the last report, namely, £110,000. The revenue and expenditure account, including all expenses during the year, shows a balance of £8,315. From this has been deducted the balance standing to reserve of £7,500, leaving an amount of £815 to the debit of this account. In accordance with the policy outlined in the last report, it was decided that the mine should resume crushing operations with the old mill, in order to provide the balance of money required for the cost of erection of the new plant, and the mill started work on 8th December, 1913, and has been continuously crushing since that date. The results to the end of May 1914, were as follows:—

	Tons.	Value.	Working Mine Profit.
December, 1913	1,300	£4,571 13 6	£3,257 17 4
January, 1914	1,738	4,329 10 0	3,019 14 10
February	1,831	4,189 9 6	3.271 9 5
March	2,155	4,133 5 3	2,756 16 0
April	2,152	4,267 19 0	2,852 7 9
May	1,995	4,476 12 9	2,989 1 7
	11,171	£26,271 10 0	£18,150 6 11

The order for one-half of the plant was placed at the end of last year. This included the whole of the cyanide works, and the engineer reported that he hopes by October to be able to commence the treatment of the accumulated slimes. The order for the balance of the plant has since been given, so that the whole plant should be erected and in operation by March, 1915. Owing to the pressure of his other duties, Mr. Warren has retired from the Board in December last. The directors elected Mr. Seymour Fort to act in his place, who, in accordance with the articles of association, retires, but, being eligible, offers himself for re-election.

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THE DEVELOPMENT OF SOUTH AFRICAN RESOURCES.

National Union's Appeal—South Africa's Opportunity—Fillip to Local Production.

Mr. H. E. King, Secretary of the South African National Union, writes urging, inter alia, the need of increased development in view of the present situation. It must be obvious, he points out, that the dislocation of our trade caused by the unfortunate state of affairs in Europe, means that South Africa has not only an opportunity, but also a duty, to set about developing her own resources to the utmost extent. There are many directions in which that can be done, and each will be to the permanent advantage of the country, for an industry once established on sound business lines, will be oble to retain the position it has reached in the commercial world of the country.

The large flower mills that have been established in different parts of the Union have created a demand for wheat which the country is not yet able to supply. £1,827,000 was sent oversea last year to purchase the balance required. It is doubtful if we produce at present one-half of the wheat we need. In the production of that one article alone there is scope for abundant energy, for not only will the demand continue and increase, but the price will remain firm. We can turn out, if necessary, all the oatmeal the country wants if the farmer grows the raw material in sufficient quantity, and of the right quality of grain. As regards barley, it is well known that the breweries are obliged to import malt to the value of £90,000 each year for the lack of enough proper malting barley. Because the export of maize has ceased temporarily the maize farmer should not curtail his output. There is bound to be an increasing use of maize for fattening purposes, because fat stock of all kinds will be in demand, and there will be a large market for maize oversea by the time the next crop has matured. In the production of butter, cheese, eggs, hams, bacon and poultry, the farmer has now an extraordinary opportunity for profitable energy, for there will be inevitably some increase in the value of each. If at this time the producer gets the confidence of the public by supplying a good article, it will not be easy to displace him from the local market. There is reason for thinking that at least an ordinary season of rainfall may be expected.

But it is not only the farmer who will profit by a curtailment of imports. There are to-day quite a large number of manufactured articles produced in South Africa—the actual quantities of which are far from generally realised. Tea, sugar, salt, soap, candles, matches, biscuits, jams, confectionery, canned and dried fruits, pickels and sauces are but a few of the things in every day use which it is possible for the country to produce in far larger quantities than at present, if practical encouragement is given by the public.

The present lamentable conditions of things in Europe should stimulate internal production in South Africa, for the area of our market will in all probability be increased. Both the farmer and the manufacturer should take advantage of the opportunity now presented to them of building up, and retaining, if they will, a big local trade. It is true that large sums of money may, in certain contingencies, be locked up in those products we must send oversea, such as wool, bark, gold, diamonds, copper and tin, but these are assets that do not deteriorate and will be realisable sooner or later. Gold we must put out as fast as we can, for that is a prime need of the Empire, and as soon as we have gold we can get along financially, either by the issue of notes or the coining of sovereigns.

The fact of the other Country being involved in the greatest war of modern times is one that they may well make us pause in all our undertakings. Generally we are bound to suffer in common with the rest of the world, but that is all the more reason why we should carefully examine the conditions of our own house to see if anything can be done to improve it. Unquestionably we shall have an opportunity of developing the agricultural and manufacturing industries of the country, for existing conditions will soon put these industries on a more profitable basis.

The Golden Kopje Mines.

The report of the Golden Kopje Proprietary Mines, Ltd., for the year ended 31st March, 1914, submitted to the meeting on the 22nd ult., states that the ore reserves remain the same as in last year's report—namely, 310,746 tons, of an average assay value of 8 dwts. During the year the main shaft was sunk to a depth of 286 feet and stope driving has been carried on and other preparation made for regular stoping. No development or exploratory work has been done, the efforts of the management having been concentrated on the erection of machinery and plant, with a view to bringing the mine to the productive stage at the earliest possible date. In consequence of delay in the forwarding of some of the most important portions of the plant, a trial run of a section of the plant could not be made until 20th June. It is now anticipated that a trial run of a section of the complete plant will commence this month, and that the same should be in full running order early in August. The attention of the shareholders has already been called to the fact referred to in the engineer's report that, owing to the usual preliminary absorption of gold in the tube mills, zinc boxes, etc., the total amount of gold called for will probably not be recovered during the first few months of crushing. Owing to the unavoidable postponement of active operations, which has entailed some additional expenditure, it will be necessary to further finance the mine during its unproductive stage; it is estimated that about £21,000 will be required over and above the funds available before the mine becomes self-supporting and arrangements will be made to provide for any temporary deficiency.

Enterprise at Barkly.

The construction of a breakwater on the Vaal at Barkly West marks the enterprise of a local partnership. A good area has been enclosed, and pumping operations are in progress to remove the water, and thus get to the alluvial. The work has been costly, and those interested have good wishes for their venture.

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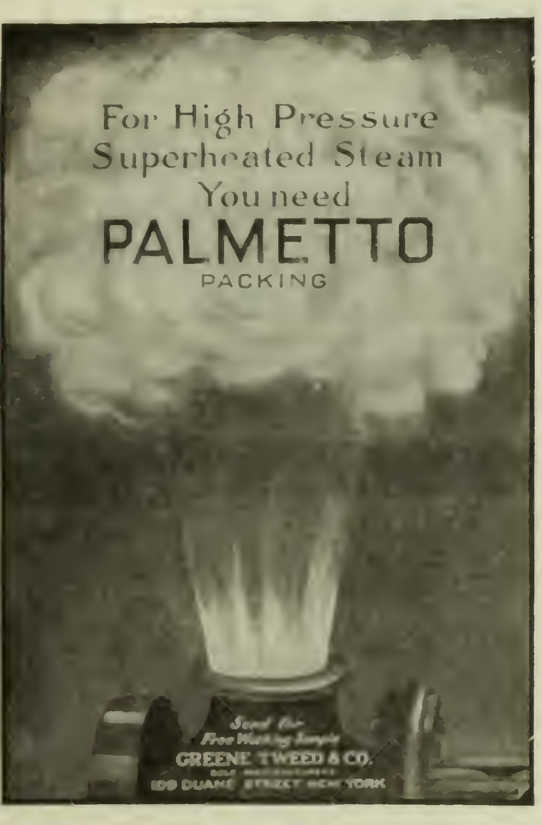

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Engineering Notes and News.

THE ECONOMIC USE OF WORKMEN ON THE RAND.—IV.

Continuation of Mr. E. J. Way's Thoughtful Paper.

The following statement shows what would be the position if the above ideas were carried out on a well-known mine on these fields:—

Table showing the Numbers Employed and the Wages Earned under the Present Conditions, and under the Scheme as Suggested.

Class of Work.	During September, 1913.				Under New Scheme.			
	Average Number Employed.	Average Earnings.			Number to be Employed.	Estimated Earnings		
		£	s.	d.		£	s.	d.
Hand Stoping	5	206	7	7	—	—		
Reclaiming	1	21	13	4	—	—		
Machine Stoping	41	2,062	10	11	—	—		
Machine Learners	21	148	16	6	21	148	16	8
Shovelling and Tramming	40	810	3	0	—	—		
Platelaying	4	101	5	0	3	76	0	0
Timbering	31	843	6	8	4	*120	0	0
Rock Walling	14	222	14	6	—	—		
Banksmen	5	120	16	8	5	120	16	8
Skipmen	15	337	16	8	—	—		
Onsetters	5	110	5	0	6	120	0	0
Engine Drivers	6	183	7	6	6	183	7	6
Winch Drivers	7	120	11	8	—	—		
Pumpmen	5	143	16	5	4	123	5	10
Drill Carriers	4	97	15	0	—	—		
Shaft Maintenance	26	851	5	3	26	851	15	3
Sanitation	1	23	8	0	1	23	8	0
Fan Drivers	2	38	5	0	2	33	5	0
Stope Watering	8	114	1	6	—	—		
Mine Supervision	16	736	19	1	—	(See below.)		
Surveyors and Samplers	11	248	8	4	11	248	8	4
Shaft Sinkers	2	359	11	6	—	—		
Hand Development	1	27	10	0	—	—		
Machine Development	20	1,071	9	6	—	—		
Pipe Fitting	9	203	1	8	3	78	0	0
Native Supervision	1	40	0	0	1	40	0	0
Mine Captains	—	—			3	200	0	0
Overseers	—	—			25	1,000	0	0
Assistant Overseers	—	—			30	938	0	0
	301	£9,245	16	3	159	£4,360	3	1

*Hanging Inspector.

It will be seen that the white wages bill of £9.245 per month could on the conditions stated previously, be reduced to £4,360, and the number of white men underground by one half. A white labour policy which is merely based upon sentiment cannot survive, and it behoves the mining industry here to look into this position with the greatest care and compare that position with work being done in other parts of this Southern Continent, where, if similar conditions for employment of labour existed, industry would practically cease. In the district of Nyassaland the country is one of entirely black labour, and a friend of mine (who was a most successful mine manager here at one time) says in a letter received last April: "This is a country of entirely black labour, and it really does open one's eyes to see what a native *can* be trained to do; any trade, in fact. Good carpenters, who can in many cases equal ——'s work" (here he refers to a carpenter well-known to the writer and myself), "can be had for 15s. per month. Bricklayers and smiths from 8s. to 10s. per month. A Rand mine up here could be worked at from 8s. to 10s. per ton or less. Ordinary hoe boys get 4s. per month, and what saves the country is this cheap black labour. It is true it is counterbalanced by the heavy transport and freight charges, some £6 per ton. Mealies can be grown and sold at a profit for 30s. per ton, but the £6 required to send them down the Zambesi and then to South Africa kills the export. It is, of course, *very* cheap living."

In a mine in Rhodesia, which is making profits and paying dividends, nearly all the skilled labour is done by the natives, as shown hereunder. Painter.—This native does all the painting required on the property, including interior decoration of private houses. He mixes all his paints and carried out the work as well as any white man. Wages, 2s. per diem, plus 6.17d. for food. Engine Drivers (Central).—These natives work the main hauling engine on eight-hour shifts and pull all quartz necessary to supply the mill. In addition they lower and raise all white and native men. Wages, 1s. 6d. per diem, plus 6.17d. for food. Engine Drivers (Hoists).—These natives work the smaller hoists on various sections of the property, lowering and raising men, etc. Wages, 1s. 6d. per diem plus 6.17d. for food. Tool Sharpening.—These natives sharpen all the hand steel used throughout the mine, but do not sharpen the machine drill steel. Wages 1s. 4d. per diem, plus

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6.17d. for food. Native Timekeepers.—These are educated natives, who keep the native time registers, tickets, etc. Wages 1s. 9d. per diem plus 6.17d. for food. Carpenters.—These natives frame [illegible] sets of [illegible] for [illegible] used in connection with shaft sinking. They work to a template supplied to them. Wages 1s. 4d. per diem plus 6.17d. for food. Timbermen.—These natives are engaged in [illegible] and carry out the necessary timbering of [illegible], etc. They frame and cut all their own setts. The [illegible] of the bad nature of the ground, requiring much timber. Wages 1s. 4d. per diem plus 6.17d. for food. Electrician.—This native is a [illegible], and wires and lights all buildings, repairs and keeps in order the main transmission line carrying 9,000 volts, [illegible] transformers, keeps [illegible] in order, and [illegible] faults on electric power lines. Wages 1s. 4d. per diem plus 6.17d. for food. Bricklayers.—These natives are skilled bricklayers, and are capable of erecting a brick building. Wages 1s. 3d. per diem plus 6.17d. for food. Crusher Station.—These natives are left in charge of a crusher station during night shift. They supervise 7 natives, and run five crushers, attend to the motor, and handle approximately 100 tons of ore through the crusher station per shift. Wages 1s. 6d. per diem, plus 6.17d. for food. Fitter.—This native does all the [illegible] of belts, and has under his [illegible] in the workshops. Wages 1s. 2d. per diem plus 6.17d. for food. Machine Rock Drillers.—These natives [illegible] Ingersoll rock drills. Wages 1s. [illegible] per diem plus 6.17d. for food. Pipe Layer.—This native lays all pipes throughout the mine and keeps the same in repair. Wages 1s. 3d. per diem plus 6.17d. for food. Track Layers.—These natives lay all necessary track throughout the mine. Wages 1s. 4d. per diem, plus 6.17d. for food. The number of boys each white man supervises in Rhodesia is a [illegible] for these boys, who, through their [illegible] to reduce still further the number of natives to be supervised by the [illegible] white man.

The following list gives the wages per shift of the white miner and the number of boys which he has to supervise:—

Number of Boys under Supervision of One White Man.

Occupation	Wages per Shift. s.	d.	Number of Boys Daily under his Supervision.
Miner	25	0	80
Miner	22	6	70
Shift Boss and Miner	27	6	35
Miner	22	6	60
Miner	22	6	80
Miner	22	6	80
Miner	22	6	80
Shift Boss and Miner	27	6	80
Crusher Attendant	16	8	74

There has been only one fatal accident on this mine in three years. For the purpose of demonstrating the extraordinary position of workmen on the Witwatersrand goldfields, I have applied these actual definite facts from Rhodesia to another mine working on the Witwatersrand, allowance also being made for large increases of wages above ordinary native rates to skilled black or coloured workers. At the same time I have taken the methods of the Witwatersrand and applied them to a mine in Rhodesia, and the results are as follows:—

Rand Mine.—Statement showing number and earnings of Europeans employed for the month of May, 1914, together with a statement showing the number of Europeans that would be employed, and the number that would be displaced by coloured labour and the saving in wages thereby, if all restrictions against the use of coloured labour on the Witwatersrand mines were removed.

(To be continued.)

More Power for the V.F.P.

Mr. R. N. Kotze, the Government Mining Engineer, presided this week at the New Law Courts over a board consisting of Mr. [illegible], Registrar of Mining Titles, and Mr. J. A. Vaughan, Chief Inspector of Engineering, whose duty it was to hear evidence in support of the application of the Victoria Falls Power Company for certain amendments of details of power. The application was that there should be no power at Brakpan, that the Simmer Pan allocation of [illegible] kilowatts should remain as before, and that the Rosherville figure should be increased to 15,000 kilowatts. [illegible] appeared on behalf of the Victoria Falls Power Company, and having submitted his application, a private meeting of the board was afterwards held, the result of which, with the Government's decision on their report, will be announced in due course.

In regard to the proposed Table Mountain Funicular Railway, steps have been taken to secure the services of a [illegible] engineer from Europe to supervise the construction, and provision has been made for a sum not exceeding £[illegible] to be expended during the current year.

New Patents.

263. Emily Grace Wilson.—Improvements in and connected with internal combustion engines.
264. George William Porter.—Porter's patent.
265. Dr. Bernhard Heymann, Dr. Richard Nothe, Dr. Oskar Dressel and Dr. Anton Ossenbeck.- Improved manufacture of ureas of the naphthalene series.
266. Benjamin Graemiger.- Improvements in driving machines by electromotors and the like.
267. Leon Hirschberg, Potential Developments, Ltd.—Improvements in or relating to the treatment of hydro carbons.
268. John Emery Bucher.—Improved process for producing cyanides.
269. Herbert Pearce, John Ernest Billington, and Linotype and Machinery, Ltd.—Improvements in typographical composing machines.
270. Adrien Armand Maurice Hanriot.- Process for the treatment of ores and solid salts by electro chemical reduction.
271. The Dunlop Rubber Company, Ltd., and Colin Macbeth.—Improvements in or relating to tyres for vehicle and similar wheels.
272. James Bennett and William Edward Elbeshausen.—Improvements in closure devices for making bottles and the like non refillable.
273. Alexander Douglas.—Improved electric staff exchangers.
274. Felix Carl Ernst.—An electrical apparatus for treating chickens and thereby stimulating their growth.
275. Hester Maria McGregor.- Improvements in and relating to curtain rods.
276. Richard Morrison McDonald and Frederick Claude Sturrock.—Improvements in means for preventing the dissemination of dust from rock drills.
277. William Fyfe.—An improved method of fastening pulleys to cam shafts in stamp batteries.
278. Philip James Guymer. Improvements in gates, doors and the like.

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New Companies.

Frieda Pietersburg Gold and Development Co., Ltd., Erf No. 6, Mare Street, Pietersburg; capital, £10,000.

The Spies Tributing Syndicate, Ltd., Erf No. 101, Church Square, Piet Retief; capital, £800.

Betsiriry Proprietary Oil Fields, Ltd., 82-84, Exploration Buildings, Johannesburg; capital, £75,000.

J. W. Augood, Ltd., 239, Church Street, Pretoria; capital, £10,000.

Joseph Sydney, Ltd., shop No. 4, Marlborough House, corner Commissioner and Eloff Streets Johannesburg; capital, £300.

Chittenden and Co., Ltd., 23, Loveday Street, Johannesburg; capital, £3,000.

Volck, Ltd., 7 and 8, Old Arcade, Market Square, Johannesburg; capital, £1,000.

Joosub, Ltd., 188, Prinsloo Street, Pretoria; capital, £6,000.

The Nugent Trust, Ltd., 187, Pretorius Street, Pretoria; capital, £50.

Scrap Metals, Ltd., 100, Permanent Buildings, Harrison Street, Johannesburg; capital, £100.

The Language Syndicate, Ltd., farm Lisbon No. 9, district Lydenburg; capital, £600.

Dunswart Iron and Steel Works, Ltd., 22, Central House, Simmonds Street, Johannesburg; capital, £25,000

Gabriel and Broom, Ltd., Stand 497, Marshalls Township, corner Smal and Anderson Streets, Johannesburg; capital, £1,000.

Pretoria Farms, Ltd., Wittontein, 53, Pretoria North, Pretoria district; capital, £1,500.

South African Newspapers, Ltd., 41, President Street, Johannesburg; capital, £1,000.

Foreign Companies Registered.

White's South African Cement Co., Ltd., care of William Pott, B. and T. Buildings, Commissioner Street, Johannesburg; capital, £100.

Spitzkop Colliery, Ltd., care of John Curthew Sanders, Ermelo; capital, £10,000.

Coles Co., Ltd., care of James Blacklock, 4, Standard Bank Chambers, Johannesburg; capital, £3,000.

The Folakara Oil Fields, Ltd., care of Charles Wilson Herald .71, Standard Buildings, Joubert Street, Johannesburg; capital, £110,000.

Robert Hudson, Ltd., care of Alexander Stanley Benson, 28-30, National Mutual Buildings, Johannesburg; capital, £100,000.

Lilydale Diamond Prospecting Syndicate, Ltd., care of Herbert Robert Samuel Gibbon, 132-4, New Stock Exchange Buildings, Johannesburg; capital, £3,000.

The Manambola Oil Syndicate (Madagascar), Ltd., care of David Turner, United Safe Deposit, Fox Street, Johannesburg; capital, £130,000.

Notices of Reduction and Increase of Capital.

The Modderfontein Deep Levels, Ltd., Johannesburg; increased from £394,500 to £395.302.

Vaal River Salt Works, Ltd., Johannesburg; increased from £3,500 to £4,000.

Afrikander Proprietary Gold Mines, Ltd., Johannesburg; reduced from £280.000 to £44.800.

Afrikander Proprietary Gold Mines, Ltd., Johannesburg, increased from £44.800 to £89.600.

South African Alkali, Ltd., Johannesburg; increased from £20,000 to £25,000.

Liquidations,

The following companies have been placed in liquidation:—

Bantjes Exploration Syndicate, Ltd., Johannesburg; voluntary.
Inhambane Sugar Estates, Ltd., Johannesburg; voluntary.
The Rand Chemical Works, Ltd., Johannesburg; voluntary.
Western Farming Co., Ltd., Johannesburg; voluntary.
The New Gold Venture Syndicate, Ltd., Johannesburg; voluntary.
G.E.A. Syndicate, Ltd., Johannesburg; voluntary.
B. Timoney, Ltd., Johannesburg; by order of Court.
Settlers' Syndicate, Ltd., Johannesburg; voluntary.

Automobile Notes.

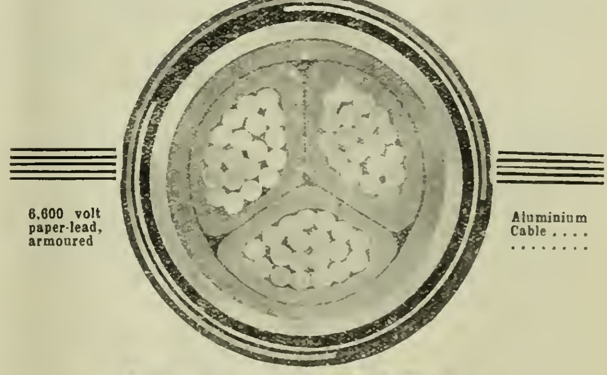
The feeling which has driven some motorists in England to combine for the purpose of providing themselves with cheaper fuel, is not to be wondered at when the publication of petrol profits demonstrates so convincingly that they are paying a higher price for their fuel than they should be asked to pay. The report of the Shell Transport and Trading Co., Ltd., makes interesting and instructive reading. The profits for 1913 amount to £1,581,200—an increase of £422,000 over 1912. The shareholders are getting a dividend of 35 per cent., as against 30 per cent. in 1912, and 20 per cent. in 1911. It was in February, 1913, that the price of petrol was last raised.

Since that date various causes have combined to check further advances in price—the increased output of benzole, for instance, due to improved methods of distillation, and the discovery, in different parts of the world, of new oilfields. The latest discovery at Calgary, Alberta, Canada, is the most important in the latter category, and the fields now being developed there bid fair to become the most important in the world. In spite of the amazing increase in the demand for motor fuel, these new sources of supply may have the effect of bringing down the price of petrol.

In the meantime numbers of private consumers in England have taken measures to protect themselves by acquiring oil-wells and working them for their own consumption. Two of these new supplying concerns are already in full operation—the Motor Petrol Association, Ltd., and the Motor Fuel Corporation, Ltd.—and are delivering petrol to their members at 10d. a gallon. This charge covers delivery at the nearest railway station, and in many cases the railway charges include delivery at the consignees' address. Each share entitles the holder to purchase a definite quantity of spirit per annum.

Blaauwbosch Diamonds.

The washing returns for July, 1914, were as follows:—Blue ground washed, 9,491 loads; recovered 1,586 carats, or 16·71 carats per 100 loads.



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Finance, Commerce, and Industries.

Cape Manufacturers.

The position of South Africa in view of the European situation has been fully discussed by the Executive Committee of the Cape Province Manufacturers' Association. It was suggested that manufacturers should strain every nerve to keep their factories working, so as to prevent men from being thrown out of employment; further, that should it become necessary to restrict employment, every effort should be made to retain the present staffs by putting [illegible] on short time, and so bring about a distribution of wages and prevent any undue hardship to particular families.

* * * *

Sugar Ring Ultimatum?

The following circular letter has been received from a Durban firm in connection with the price of sugar:—Dear Sir,—No. 1 Refined Sugar: We beg to notify you price has this day been advanced to 17s. free on rails at Refinery. Lots 1,500 pocket lots. Preference in allotments will be given to those firms prepared to pay cash. We wish to make it quite clear the quantity available to each firm will be strictly limited, and that delays in despatch will be unavoidable. Delivery orders will be issued as and when supplies are available, and there is no probability whatever of any [illegible] [illegible] leaving the Refineries for several days. There must also be an honourable understanding that the merchants will not ask anything more than a normal profit when retailing. Should we find that any firm is making profits beyond the ordinary rates we shall have to refuse making supplies to such firms. We feel justified in taking up this attitude as the Refineries are not seeking to take undue advantage of war conditions, but it is [illegible] are keeping prices within reasonable bounds if merchants follow the course we have in view of protecting consumers in the present crisis.—Yours faithfully, ———.

In connection with the above, which is nothing more than a Sugar Ultimatum, the sugar refiners would appear to control the whole of the sugar market. Nobody can get sugar except through them, and they will only sell to certain people they like—wholesale houses and sugar brokers. The minimum quantity, it may be noticed, is 1,500 pockets. The price, it is contended, was fixed at 15s. on the 1st August, and ordinarily the price then fixed rules throughout the month. Because of the war there is a sudden jump in the price, and it is claimed that there is more sugar in South Africa than we know what to do with. One gentleman who discussed the question declared that the rise was totally unjustifiable. "There is no rise in the price of tea," he said, "nor in the price of soap and candles, yet on the by-products of sugar, such as treacle and golden syrup, there was an increase of 50 per cent. The merchant is not to blame; the fault is with the sugar Ring."

* * * *

German-African Shipping.

In view of the war, a brief review of German African shipping may be of interest. The D.O.A. Line have three new steamers ready, one of which, the "Kigoma," 8,100 tons, was delivered in March. The others will be 9,000 tons each and are for the same service. The former is a sister ship to the splendid Imperial mail steamers "Tabora" and "General," with those excellent arrangements of general promenade, gymnasium, hall, swimming tanks, [illegible] halls, and of course, wireless telegraphy. In conjunction with the Woermann Line, the Hamburg-Amerika Line (African service), and the Hamburg-Bremen Afrika Line, the Deutsche Ost-Afrika Line maintains a main line service round Africa by the western route twice a month, and also round Africa by the eastern route twice a month. By the former the ports of call are being added to, as, in addition to German South-West Africa, British South Africa, Lourenço Marques, and East Africa, calls will now be made at Lobito Bay and Mossamedes, in Portuguese Angola. On the eastern route the calls are similar after passing through the Suez Canal, Portuguese Angola again being added. The express cargo service route is through the Suez Canal or the Atlantic to East and South Africa and Madagascar, returning by the same route; and the Bombay Line is a regular mail and passenger service between Bombay and the East and South-East Coast of Africa and Madagascar in connection with the main line steamers. Then there are coasting lines, with regular services between German East Africa and Portuguese East Africa in connection with the main line steamers. Only mails and passengers are taken by the main line steamers for Lobito Bay, Mossamedes, Swakopmund, and Lüderitzbay. The Woermann Line has also played a prominent part in the development of Africa since its establishment of a regular steamship service thirty-three years ago. There are no less than fifteen services to different parts of the coast, going as far south as Luderitzbay and starting from Hamburg. Some of these are in conjunction with the Deutsche Ost-Afrika Linie, the African service of the Hamburg-Amerika Linie, and the Hamburg Bremen Afrika-Linie. Upwards of sixty steamers are employed, about forty of which compose the Woermann fleet. During the year there were added the "Henry Woermann" and the "Professor Woermann," each of 6,000 tons. Four others are being built: one, the "Hilda Woermann," will be 7,000 tons, and the others 6,000 tons.

The Premier Mine Position.

The Board of the Premier Company have issued the following circular to deferred shareholders:—"Shareholders must be aware that, owing to the outbreak of war in Europe, the diamond markets of the world have been completely dislocated, and that the directors, after consultation with the Government, which holds a large stake in the diamond industry, have come to the conclusion that it is imperative to conserve the resources of the company. With this end in view, the Board has very reluctantly decided to postpone, until further notice, payment of the dividend on deferred shares, which was declared in June last. The payment to the Government of its share of profits accruing in respect of this dividend has also been deferred, with the Government's approval. Having regard to the most grave condition of affairs, the Board is confident that shareholders will accord this policy their entire support."

Transvaal G.M. Estates.

The estimated profit on the operations of the Transvaal Gold Mining Estates, Ltd., for July was £19,566.

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CONTENTS.

PAGE

Notes and News 629

Topics of the Week:

The Industry and Business as Usual 631

Share and Metal Market Outlook 632

Gold Resources of the British Empire 633

Coal Resources of the Union 634

Further Facts about Germany's African Colonies... ... 635

Mining Men and Matters 636

Underground Staff of the Village Main Reef G.M. Co., Ltd. 637

"Safety First": Prevention of Accidents 638

"Myers-Whaley" Shovelling Machines 639

Rhodesian Section:

Latest Mining News 640

Engineering Notes and News 641

The Economic Use of Workmen on the Rand.—V. 641

Notes and News.

"S.A. Mining Journal" Exchange.

With the Stock Exchange closed, it has been represented to us that the time is opportune to offer facilities in our advertising columns for the purchase and sale of securities for cash. No speculative dealings, of course, are ever possible through the *S.A. Mining Journal* Exchange. But sellers who desire money for securities they hold, and buyers who desire securities at the present low prices, and are prepared to pay cash can usefully avail themselves of the *S.A. Mining Journal* Exchange. Write stating name of stock or share, the amount and the price required, together with a postal order for 5s. for each item announced, with a stamped addressed envelope. Announcements should reach this office by 5 p.m. on Thursday of each week to ensure publication in that week's issue.

* * * *

The Diamond Conference.

The paper, *Weekblad van den Algemeenen Nederlandschen Diamantbewerkersbond, Amsterdam*, of July 10, says: "Just before going to press we received from our correspondent the following information regarding the conference, which may be considered as official: 'It has been decided: Firstly, that the London syndicate will become the sole seller for all the large producers, consequently for the De Beers Consolidated Mines, Limited, the Jagersfontein Company, the Premier Company, and the German Regie. Secondly, the production of all kinds of diamonds, without exception, will be decreased considerably; no more will be marketed than may reasonably be considered as satisfying the needs of the market. We will, therefore, now get a period without over-production and without competition—a period which all parties interested in the diamond trade will hope to last long. There have also been framed other measures relating to the actual sale which will prove to be very beneficial for the condition of the trade. We are, however, not justified in announcing these measures for the time being.'"

* * * *

Admiralty's Demand for Coal.

According to the Cardiff papers in mail week, seldom, if ever, has there been so much animation in the coal market than there was when the news became known that the British Admiralty authorities had notified all the collieries on the list that they would take all the output until further notice and indemnify them against any actions for breach of contract; and, further, that they were asking for a large amount of tonnage at the high figure of 13s. 6d. per gross registered ton with a guarantee of fifteen days. There was an absolute suspension of genuine business. Quite apart from any difficulties that might arise in shipping coal grave fears existed as to the financial stability of foreign firms. At a meeting of Admiralty coalowners it was unanimously decided to assist the Government in all possible ways.

* * * *

Movements in Bank Rates.

In the following table are shown the alterations which were made in European Bank Rates when the European crisis became acute:—

	25th July, 1914. %	Crisis rate %	Rise %
England	3	10	7
France	3½	4½	1
Germany	4	5	1
Austria	4	6	2
Russia	5	6	1
Italy	5	5	—
Holland	3½	4½	1
Denmark	5	6	1
Belgium	4	6	2
Sweden	4½	5½	1

Gold Holdings of European Banks.

The table given below sets out, according to the latest returns available, the position of the leading Continental banks, in regard to their holdings of gold. It is of interest as showing to some extent their relative ability to withstand any financial strain resulting from the present position of Europe. For comparative purposes a column has been added showing the position at the commencement of the Balkan War, early in October of 1912.

(000's omitted.)

	Oct. 8, 1912.	End 1913.	Present.
	£	£	£
England	37,913	34,983	38,131
France	129,403	140,696	165,654
Germany	56,470	73,793	67,842
Russia §	130,368	151,350	160,111
Italy*	46,044	48, 81	48,280
Austria	51,992	51,666	52,119
Spain	17,198	19,169	20,760
Sweden §	5,413	5,672	5,878
Belgium*	11,947	12,496	13,228
Netherlands	12,436	12,624	13,426
Switzerland	6,988	6,813	7,960
Norway	2,142	2,657	2,916
N. York Assoc. (species)	64,782	63,164	77,013

§ Excluding balances abroad. * Total coin and bullion.

* * * *

Paris and the Rand.

Writing on July 26, the *Revue Parisienne de Banque et de Mines* says:—" Le marché sud-africain a naturellement payé son tribut à la baisse violente qui s'est produite sur toutes les places européennes et qui a affecté indistinctement tous les compartiments de la cote. Il faut pourtant reconnaitre qu'il a été l'un de ceux qui ont supporté le plus vaillamment la tourmente et que les écarts proportionnels des cours y ont été relativement peu élevés. On trouvera plus loin le discours du président de la Rand Mines; c'est un document qu'il faut lire avec soin, car il contient sur l'industrie aurifére du Transvaal des indications générales que tous les porteurs de mines d'or ont intérêt à retenir. Les points essentiels de ce discours sont ceux qui sont relatifs à l'abaissement du prix de revient; on y verra que, l'année derniére, des progrès importants ont été réalisés dans cet ordre d'idées et qu'il en reste de nouveaux à accomplir. La question relative à la constance de la teneur en profondeur est aussi particuliérement intéressante, et, somme toute, il se dégage de ce document une impression d'optimisme que le marché aurait certainement partagée si les événements lui avaient permis de se manifester."

* * * *

Business Outlook.

"English commerce," says Sir Alfred Mond, "will be in a better position than ever after the war. A good deal of Germany's export trade will be diverted to us. France will be more inclined to trade with England than with Germany. I had hardly dared to hope that the business world would be in so comparatively good a position after a week of a European war. It is almost impossible to believe, so comparatively normal are the conditions, that a war is going on at all." The people of the Dominions will rejoice [illegible] at the news that "all is well with England."

* * * *

Prospecting in German East Africa.

A correspondent writing to a Queensland paper says:—I have just returned from German East Africa, and I was fortunate in discovering a very fine gold reef of large formation, about 12 yards wide, the lode can be traced for over a mile. I have pegged 164 acres, and intend returning again in a few days, when I hope to locate other reefs. This is in a new district, and from what I have seen will be the best find here. There will be a move here before long in mining. I hear that in German East Africa tin has been found, and in three months' time I hope to go to a part [illegible] will take bearing judging from specimens I have seen. It is very difficult prospecting here during the wet season, as the long grass is so high, but in the dry season it can be burnt off, and it is then a picnic prospecting. A prospector living here must be fairly strong.

A Great National Institution.

We understand that Mr. Arthur Yates, formerly a well-known figure in the mining community of the Rand and brother of Professor Yates, has been appointed lecturer on mining at the Royal School of Mines, London. Mr. Yates, who since leaving the Rand has been managing gold and other properties in different parts of the world assumes his duties at the great alma mater of mining men at an early date. The appointment is apparently in pursuance of a policy of expansion this famous teaching centre is undergoing, which to a large extent has been assisted by the munificent donations of Werhner, Beit & Co., which have enabled the authorities to extend and equip the school in a manner commensurate with its status. Sir Warington Smyth and Sir Neve le Foster have been worthily succeeded in the professorial mining chair by Professor Frecheville, who as head of the mining department and assisted by Professors Cooke and Truscott, promises to more than maintain the prestige of this great national institution.

* * * *

The Importance of the Mining Industry.

The importance of the mining industry to the Union's finances appears from a glance at recent statistics. Of the total exports of South Africa in 1913 raw gold furnished £40,476,600 and diamonds £12,019,763, being together 77·3 per cent. of the total produce exported. The revenue derived by the Union Government directly by tribute or taxation from the mining industry for the financial year ending March 31st, 1913, was represented at £2,359,263. The salaries and wages earned during 1913 in the gold and coal mines of the Transvaal amounted to £13,926,431, and the stores purchased for consumption by the gold mines during the year ending December 31st, 1913, showed a value of £10,579,712. Again, South Africa is, of course, the biggest contributor to the world's supply of gold. Although the gold mining industry of the Transvaal is less than thirty years old it has already yielded gold to the value of £400,000,000, and at the present moment nearly 40 per cent. of the total annual output of the world is derived from that source. Mr. Leisk, the Secretary of the Finance Department of the South African Union, stated as his deliberate opinion that it would not be any means an exaggeration to regard 60 per cent. of the revenues of the South African Union as being directly or indirectly attributable to the mining industries, leaving only 40 per cent. as the yield from all other sources. Speaking broadly, the mining industries provide four-fifths of the total exports of South Africa and three-fifths of its revenue. The Dominions Commissioners estimate that three-fourths of the mining revenue, or 45 per cent. of the total revenue of the whole country, comes from the Rand. In other words, out of a total Government revenue amounting to about £27,000,000, derived from taxation and mining receipts, the Rand contributes about £12,000,000. This compares with £8,000,000 paid to shareholders and £8,000,000 paid to white miners and other white employees. Nor is that the full measure of the Government's interest in the gold mining industry. It is the biggest partner in the vast undeveloped area which lies mainly in the East Rand. Out of 86,000 claims there the mining rights in four-fifths are vested in the State. According to the estimate of Mr. R. N. Kotze, the Government Mining Engineer for the Union of South Africa, if only 30 per cent. of these claims prove payable, and each payable claim contains 25,000 tons (which is presented as a conservative estimate), there would be 500,000,000 payable tons of ore under the control of the Government, and if the profits accruing to the Government amounted to only 2s. 6d. per ton they would represent £62,500,000, or approximately half the present total debt of the Union of South Africa.

* * * *

The Berlin Bourse in the Crisis.

The scene on the Berlin Bourse early in mail week is thus described in the *Frankfurter Zeitung*:—The course of the Bourse on Saturday was from the beginning a very different one from that of the day before. Representatives of the great banks and the chiefs of the great banking firms were present as soon as the Bourse opened, as everyone was prepared for the fact of the day being a specially critical one. The halls of the Bourse were packed to overflowing, while an interested public took up its position in the galleries, watching the excited groups below. Offers were considerably heavier than yesterday and previous days, as the public had been made anxious by the political news, and gave orders for selling, mostly without any limit. In the result far more business was done than for weeks before. It would be quite justifiable to refer to the price movements as a regular rout, but it must be pointed out that even on such a day as this the Berlin Bourse showed an agreeably surprising power of resistance, such as had never been expected from it. . . . Apart from the news that was known to everyone in the morning, numbers of the weirdest rumours were handed round and mostly believed owing to general nervousness and indecision. The greatest depression was caused by another severe attack on Russian Government securities, which could not be checked, as there was not a buyer to be found. Other Russian securities also suffered badly, as heavy holdings which had been accumulating for some time past were now realised. Enormously high rates of war insurance were quoted from Bremen.

* * * *

Three Neumann Mines.

Reports of three companies under the control of S. Neumann and Co. have now been issued for the quarter ended with June last. The most important of these is, of course, the Wit. Deep, and here the profit earned for the three months was £63,681, or approximately the same as in the preceding period. Working costs were 2d. per ton lower. Of the total development 1,775·5 feet, or 77·48 per cent., have been on reef. Altogether 1,572·5 feet have been sampled. The total comprises 1,090 feet, or 69·32 per cent., averaging 9·31 dwts., over 40·31 inches, and 482·5 feet, or 30·68 per cent., averaging 5·61 dwts., over 28·54 inches. The payable ore reserves on 30th June, 1914, were 1,704,997 tons at 6·79 dwts. over 53·54 inches. The directors repeat the statement published on July 15th as to the shortage of native labour and the effect on tonnage milled. At the Consolidated Main Reef the profit earned was £34,566, exclusive of £3,666 derived from a special clean up. This compares most favourably with a profit of £23,909 earned in the March quarter. Development particulars are:—Excluding main crosscuts, stations, ore passes and prospecting work, 2,872 feet, or 80·9 per cent., has been on reef, and of this 2,772½ feet have been sampled. Of this 1,758 feet, or 63·4 per cent., has been payable of an average value of 8·6 dwts. over 48 inches, and 1,014½ feet, or 36·6 per cent., has been unpayable of an average value of 3·2 dwts. over 48 inches. Of the payable portion 1,671½ feet, or 95·1 per cent., has been on Main Reef Leader, average value 8·7 dwts. over 48 inches, and 86½ feet, or 4·9 per cent., has been on South Reef, average value 7·1 dwts. over 48 inches. The ore reserves as at 30th June, 1914, are being re-calculated. At the Main Reef West the profit was £13,976, or a little more than in the three months ended with March, when £13,146 was earned. Ore reserves at the end of June are being re-calculated. Development particulars for the three months are:—Excluding main crosscuts, stations, ore passes and prospecting work, 2,389 feet, or 81·1 per cent., has been on reef. Of this 865½ feet, or 36·2 per cent., has been payable of an average value of 7·8 dwts. over 48 inches; and 1,523½ feet, or 63·8 per cent., has been unpayable of an average value of 3·1 dwts. over 46 inches. The payable portion has all been on Main Reef Leader. Of the unpayable portion 1,072 feet, or 70·4 per cent., has been on Main Reef Leader, of an average value of 3·6 dwts. over 48 inches; and 451½ feet, or 29·6 per cent., has been on South Reef, of an average value of 1·7 dwts. over 42 inches.

TOPICS OF THE WEEK.

INDUSTRY AND BUSINESS AS USUAL.

With the payment of the delayed dividends of Rand mining companies, the industry may be said entirely to fulfil the injunction of both the Imperial and Union Governments to carry on business as usual. The Rand, indeed, is coming splendidly through the ordeal of the first days of the strife. Like the other great commercial activities of the British Empire, it has shown a truly astonishing power of resistance to the evils, actual and anticipated, of a great European war. The prophets, it will be remembered, were always divided into two schools of thought. One held that within a week of the outbreak of war Great Britain would be short of foodstuffs, her trade and industry at a standstill, and the Empire dissipated and dismembered. The other believed that the result would be quite different—that German overseas trade would be ruined, her shipping captured or swept from the seas, her colonies isolated, and serious inroads made upon her commercial solvency. The latter school has been proved right. Warned of the effects of a great war by such writers as Mr. Norman Angell, who holds that the conqueror will suffer, economically, equally with the conquered, the Imperial Government is making a big effort to maintain the processes of commerce and industry on at least a normal basis. Indeed, with magnificent prevision, the Imperial Government is seeking already to win for Great Britain some of the trade of the world sacrificed by Germany. If the warnings of the economists of the Norman Angell school have not succeeded in dissuading Great Britain from going to war, they have at any rate, apparently, had the excellent effect of stimulating the Imperial Government to foresee and counteract the financial, industrial and commercial evils that threaten every participant in the grim arena of modern warfare.

Whatever be the outcome of the present conflict it is plain that the world's trade, at all events for a considerable time to come, will be widely disturbed, and in a large measure, probably, permanently deflected into new channels. It may be of interest to note some indications of the magnitude of the trade interests involved. One immediate effect of the war is the total stoppage of trade between the belligerents. Britain does the greatest volume of oversea trade. On the other hand, Germany has to reckon with the cessation of her trade, not merely with Britain, but with the other nations who are also in arms against her and her ally. It is impossible here to estimate the complete effects of the struggle from the commercial point of view. But to merely quote such figures as are readily available, as, for example, those bearing on the normal trade between Britain and Germany, will be sufficiently suggestive. In the case of Britain it has been calculated that the immediate consequence of the breaking out of war must be the holding up of an export trade to Germany representing a value, on the basis of the 1911-12 figures, of £57,500,000. British exports to Austria-Hungary for the same period were of the value of £6,000,000. One of the problems confronting the British mercantile community just now must be that of finding new markets for this large volume of products. Taking Germany alone, we have an average of roughly speaking more than a million pounds worth of goods per week concerned. The total export trade of Germany was estimated in 1913, from such returns as were then on record, at £440,000,000, of which 70 per cent., or in round figures, £300,000,000, is seaborne. Of this 25 per cent., or about £75,000,000, was being carried in British ships, and may be considered as lost to Germany from the outbreak of the present war. Fifty per cent., or about £150,000,000, was carried in German ships, and what we have already heard as to captures and detentions in port has pointed to the certainty of a great part of this trade being at present held up. A more recent estimate, made only a few months ago, placed the total volume of German export trade at £504,000,000, pointed to as the greatest export figure in her commercial history, and implying an increase of no less than £56,200,000 over the preceding year.

SHARE AND METAL MARKET OUTLOOK

It is now possible to measure the effect of the great European War on sharemarket and metal market prices. In regard to the latter, already, it is stated, some of the American copper mines, where large numbers of foreigners are employed, are losing a proportion of their labour complements. As regards mines in which British capital is interested, and which are controlled from London, we learn that one group has, in view of the political and financial crisis, already cabled instructions to those in charge of the properties to discontinue development and construction work and to conserve profits so far as this can be done having due regard to the safety of the mines and their good working. The war has brought down with a run the quotations for copper and tin. The opinion of authorities is that copper will become a drug on the London market and will fall to a very low level in America. Many of the mines there may be forced to suspend production on account of the drop in the value of the metal, the idea being that mines which could not produce profitably at less than nine cents per pound (say, just over £40 per ton, a quotation which the metal has not seen since 1896) would have to fall out. On the other hand, the price of the metal in Russia—where the producing companies already obtain a much higher price for their output than those in other parts of the world on account of the heavy Russian import duty on copper may rise. It is thought that lead may appreciate in value, as war will have the effect of cutting off the supplies from Germany and other parts of the Continent. In this connection it is worthy of note that only one or two of the mines of the Broken Hill field in New South Wales now ship their lead concentrates to Germany, most of them having made arrangements for the local smelting of this product. The zinc concentrating plants at Broken Hill, however, may have to shut down, as the zinc concentrates produced there are shipped to Germany. The cutting off of the German production of zinc, amounting to 50 or 60 per cent. of the world's supplies, will probably cause a rise in the price of that metal, the American output of zinc being only about sufficient to meet the American consumption. Zinc, of course, is used in the manufacture of brass, and war will very likely lead to an increased demand for that commodity.

The following table, showing the drop in representative South African mining stocks and metals at the time of the closing of the London Stock Exchange, is of interest:—

Share.	1912-13. Highest.	Lowest.	1914. Highest.	Crisis Price.	Fall this Year.
*Central Mining (£12 shares)	11⅞	7¼	9	6	3
*Crown Mines (10s. shares)	7 11/16	5 15/16	6¾	5⅜	1⅜
*Modderfontein (£1 shares)	13¼	10 15/16	13⅜	11	2⅝
Modder Deep	2¼	1	3¼	2½	¾
*Rand Mines (5/- shares)	7 1/16	5⅞	6 9/16	4¾	1 13/16
*De Beers Def. (£2 10s. shares)	22¼	17 11/16	19¼	13½	6¼
*Premier Def.	15½	8½	10¼	6	4¼
Chartered	32	15/3	22/6	13/3	9/3
Shamvas	1⅞	1¼	2½	1⅞	⅝
[illegible]	2⅛	1 13/16	2½	1½	1
	£	£		£	
Copper, per ton	80	61	—	55¼	—
Tin, per ton	235	168¼	—	132¼	—
Lead, per ton	23¼	15⅛	—	18¾	—
Zinc, per ton	27½	20¼	—	21¼	—
	d.	d.		d.	
Silver, per oz.	29⅞	25¼	—	25¼	—

* Dividend payers.

Gold mining companies have, of course, one great advantage over all these stocks—metallic and non-metallic alike—in that the selling value of their product is a fixed quantity. The man who has the largest proportion of the shares of producing gold companies in his mining investment portfolio is likely to suffer financially least and for the shortest time from the effects of any European war—short of Mr. H. G. Well's' imaginative visions of a collapse of civilisation—since the world cannot do without gold as things are.

In this connection a very timely exhortation to French investors not to lose their heads in a great European war is addressed to its readers by our Paris contemporary, *L'Information*, and the lesson it teaches by showing what befel the Paris Bourse in 1870 is so useful a one that the investors of other countries might well lay it to heart as well. France that year was defeated in the biggest war imaginable, and so the history of the Bourse for that year ought to be able to let us know pretty well the worst that might happen in any country. In time of war, our contemporary observes, though it is quite true that there are certain securities which cannot be sold at any price, there are always an imposing number of solid investments whose intrinsic merits are above all caption, and which can always be dealt in even at the worst of times. And the unfortunate thing is that in a time of panic the public are apt to throw away good as well as bad and indifferent, selling all three classes at anything they will fetch. The following table of highest and lowest prices in Paris during France's "année terrible" shows that things were not so bad, perhaps, as might be imagined:—

PARIS BOURSE PRICES IN 1870.

	Highest.	Lowest.
French Rente 3 pc	75.10	50.80
Consols 3 pc	94.75	88.50
Austrian 1852 5 pc	68	61.50
Belgian 4½ pc	106	95
Spanish 3 pc	33	22.5
Dutch 2½ pc	58.75	57.50
Italian 5 pc	60.90	42.50
Portuguese 3 pc	33	29.50
Russian 1889 4½ pc	88	86.50
Turkish 1865 5 pc	55	35
Banque de France	3,940	2,260
Crédit Foncier	1,805	1,720
Crédit Lyonnais	569	400
Banque Ottomane	635	490
Nord	1,235	930
Est	620	370
P.L.M.	1,047	773
Ville de Paris 1860 3 pc	472	320
Do. 1869	368	210
Creusot 5 pc	300	260

The lowest prices in the above table were quoted during the last months of the year—that is to say, when France, overwhelmed with disasters, was actually occupied by hostile troops. Those who sold during the most evil days undoubtedly suffered great losses, but those who kept their heads and did not sell unless compelled by absolute necessity were in a position to participate with great profit in the wonderful economic recuperation with which France astonished Europe a year later.

Colliery Outputs. Whilst the Government Department of Mines gives very full particulars each month as to the coal output of the Provinces of the Union no statistics are published by that institution as to productions of the individual collieries and a few figures as to the outputs of the principal mines should therefore be of interest. Premier position is easily held by the Witbank Company, which in June produced 69,860 tons. The largest output of this fine colliery during recent months was in December last when 75,909 tons were raised. The two collieries of the Vereeniging Estates produced 36,863 tons in June, and in the same period the Dundee Company raised 31,960 tons, the Natal Navigation 30,330 tons, the Anglo-French 25,285 tons, and the Tweefontein 24,701 tons. These figures are of interest as being supplementary to the information on coal resources of the Union given elsewhere in this issue.

GOLD RESOURCES OF THE BRITISH EMPIRE.

The Rand's Position of Dominating Importance—How Long Will the German Gold Reserves Last?

"You may depend on it that no matter what happens supreme efforts will be made to keep the gold mines and mills of the Witwatersrand working at full capacity," remarked a well-known mining man to a representative of this paper in reply to a question as to the outlook for a maintenance of operations along the Main Reef series. "And you can depend on it, too," continued our informant, "we shall succeed in these efforts and that there will be no appreciable diminution of production from the auriferous conglomerate beds of the Rand. Probably no other industry in the Empire is of such immense importance to Greater Britain in this critical juncture of our history than the gold mines of the Witwatersrand. Gold is one of the few articles that the world is prepared to buy in large quantities at the present time. It is essential not only to this country that the Rand, which produces nearly two-fifths of the gold output of the world and is by far and away the greatest industry in South Africa, should not be interrupted in any way, but it is of paramount importance to Greater Britain and to the trade of the whole Empire that our mines should continue to yield up gold, for gold whilst it is valuable in times of peace is doubly valuable in times of war. Yes, the industry will be kept going. The outlook for delivery of future supplies is very bright, and every possible precaution is being taken to ensure its ordered running."

The Empire's Gold Output.

These are remarks that should induce people to ponder on the world-wide importance of the narrow strip of auriferous country which extends from Randfontein to Geduld and which furnishes nearly forty per cent. of the world's output of the yellow metal which constitutes the basis of barter. In a recent issue we declared that the part played by the Rand in providing the sinews of war in Europe must have been very important, and we can assert with even more truth that the part which the Rand will play in the maintenance of the war will be far greater. War cannot be carried on by civilised nations without money, and money is now a synonym for gold. The outlook for the British Empire in this direction is wholly reassuring. War and the ability to carry on war, the defeats of war, and the successes of war depend to-day on economic as well as military factors. Gold is the dominating factor of these considerations, and since the British Empire yields over sixty per cent. of the output of the world the conclusion that Great Britain holds a very strong hand in the desperate game now being fought out in Europe is perfectly obvious. The following table shows the approximate gold output of the world during 1913:—

Country.	Value.	Percentage of Total.
Transvaal	£37,358,000	40·0
United States	18,111,000	19·4
Australasia	10,758,000	11·5
Russia	5,137,000	5·5
Mexico	1,163,000	1·5
Rhodesia	2,931,000	3·1
Canada	2,743,000	2·9
India	2,493,000	2·7
West Africa	1,689,000	1·8
Other countries ...	8,000,000	8·6
Total	£93,416,000	100·0

Segregating countries and figures according as to whether relating to the British Empire or not, we arrive at the following calculations:—

Country.	Value.	Percentage of Total.
Transvaal	£37,358,000	40·0
Australasia	10,758,000	11·5
Rhodesia	2,931,000	3·1
Canada	2,743,000	2·9
India	2,493,000	2·7
West Africa	1,689,000	1·8
Total	£57,972,000	62·0

Great Britain, with the high seas under her command, can thus continue to import nearly two-thirds of the world's output from her own Dominions. It will be noticed that Russia, our ally, stands fourth on the list of countries and continents, so that the Triple Entente may be said to control nearly seven-tenths of the output. The United States which produces 19·4 per cent. remains neutral, and neither from that country nor from Mexico (1·5 per cent.), nor from any of the "other countries" can Germany, unless she gains command of the ocean, expect to receive any supplies.

Germany's Unenviable Position.

Germany contains no gold mines, and the one or two small producers in the territory of her ally, the Austro-Hungarian Empire, are wholly insignificant. The amount of gold that Germany has hoarded up in preparation for "the great day" is unknown. There are reported to be many millions in the war chest at Spandau, but as Germany is spending something closely approaching four millions per day on the war it is unlikely that her reserves, no matter how great they may be conceived to be will last very long. From the point of view of the military-economist, the man who sees that the sovereign is as great if not greater than the sword, the position of Germany is unenviable. In any case, it must be many years before Germany can recover her position on a specie basis. And not the least interesting thing that is revealed to the man who surveys this titanic conflict through the spectacles of money is the gold mining industry of the Witwatersrand, the industry upon which all the might of the Imperial and the Union authorities is going to be concentrated with a view to its ordered productive continuance. Our American friends declare that "money talks," and few who have played the game of life for long will deny the truth of that assertion. If it be true that "money talks" in war as well as in peace—and what thinking man will deny its greater eloquence in a time like the present?—it may soon be demonstrated that the Rand is one of the major organs of the British Empire.

Geduld Proprietary.

The report for the quarter ended 30th June 1914, is as follows:—Working Expenditure and Revenue.—Balance, £69,052 4s. 7d. (£1 4s. 4.1d. per ton); working profit, £21,358 16s. 6d.; sundry revenue, £2,578 5s. 9d.; total, £23,937 2s. 3d. (8s. 5.2d. per ton); revenue, £92,959 6s. 10d. (£1 12s. 9.3d.). Summary of operations.—Mines, 64,179 tons; waste sorted out (equal to 11.7 per cent.), 7,514 tons; milled, 56,749 tons; No. of stamps (50), ran 76.8 days; No. of tube mills (5), ran, 67.6 days; sands treated, 23,104 tons; slimes treated, 33,439 tons. Mine Development.—Driving, 858 feet; winzes, 252 feet; raises, 477 feet; total, 1,587 feet. For the three months ended 30th June, 1914, the footage sampled on the reef totalled 1,375 feet, assaying 7.2 dwts. over 38.1 inches. General.—The native labour supply has shown a slight increase during the quarter, but is at present not sufficient to enable the mill to crush at its full capacity, therefore more rock drills have been installed and hand stopes are gradually being converted into machine stopes, which method will, it is hoped, balance the shortage to a considerable extent; development work also had to be curtailed as a consequence.

COAL RESOURCES OF THE UNION.

Exceptional Activity at the Coast—South Africa's Strong Position.

COAL, as well as gold and food stuffs, is an article of world-wide demand in War as well as in Peace. In regard to fuel, as in regard to the metal that provides the basis for the world's barter and credit, South Africa is exceedingly well circumstanced, and at this stage a few facts and figures regarding the coal resources of the Union should be topical and interesting. It may at once be said that South Africa's capacity to supply coal of good quality, and at a pit head price which is lower than for any other country in the world, is only limited by the ability of the Union's Railways to transport this coal to industrial centres and to the coast. We understand that during the current month, and largely in consequence of the War, the facilities provided by the railways have been quite insufficient to cope with the productions of the collieries. This is in a large degree quite understandable in view of the special demands made upon the railways during the current month. Many thousands of tons have been hurried to Capetown and Durban by the Transvaal and Natal collieries for the Admiralty and mercantile purposes, and the demand at the coast is likely to increase in the near future, especially if a great deal of the Eastern and Australian trade is diverted from the Mediterranean-Suez Canal route to the passage round the Cape of Good Hope.

Transvaal collieries during the current month have been working at full pressure and in the Northern Natal Coal Fields there has been exceptional activity. There is reported to be considerable congestion of traffic in Natal consequent on the abnormal demand for coal at the coast. The greater the demand the more, of course, the South African collieries stand to benefit, and our resources are so vast that if the export of coal from South Africa were ten times as great as at present the seams of the existing collieries only would be able to more than supply all our industries for many years to come, provided, of course, there were sufficient equipments and freight facilities to cope with the demand. Moreover, there are enormous coal-bearing areas which are still wholly untouched, and it is quite on the cards that the demand for coal arising out of the war, may lead to the opening up of new pits and the flotation of fresh colliery propositions.

The output of coal from the collieries of the Union last month was:—

Province.	No. of Collieries Producing.	Total Coal Sold.	Total Value Realised at Pit's Mouth.	Value per Ton at Pit's Mouth	
		Tons	£	s.	d.
Transvaal	28	432,440	96,602	4	5.61
Cape	10	4,988	2,962	11	11.96
O.F.S.	5	63,185	17,314	5	5.45
Natal	20	227,188	75,691	6	7.96
Union of S.A.	63	728,101	192,590		

One Ton = 2,000 lbs.

There are few countries probably in the world where such an extensive area is covered by coal measures, productive and otherwise, as with South Africa. Except in the Cape Province, the workable coal seams are confined to the Beaufort beds, and this reduces the coal producing area to probably over one half. Then the coal seams run flat, or nearly so, which again makes the yield compared with the area low, whilst again a proportion of the Beaufort beds do not carry coal, and where the Beaufort beds do carry coal, only a small portion produces coal of equal standard to the best sold to-day either in the Transvaal or Natal.

The Transvaal has the largest area of productive coal measures of any Province in the Union, over four thousand square miles in extent, not including the worthless Stormberg beds at Komati Poort and those north of Pretoria. Less than one-tenth of this area has been proved to carry coal equal to the present Middelburg standard of a theoretical calorific value of 12.50, nearly the whole of this extensive area containing coal ranging from a theoretical calorific value of ten to twelve, and therefore of second-rate quality. Another ten per cent. runs under ten, and includes the inferior coal lying between Boksburg and the Wilge River, as also the scattered inferior coal deposits near Delmas, most of which carry coal far too inferior to use for steam purposes under to-day's requirements.

Next in area comes the Orange Free State, having an area of only a thousand square miles less than the Transvaal or Beaufort beds, estimated to be capable of yielding a serviceable steam coal, but the quality is mostly third-rate as compared with the Transvaal gradings of coal to-day, and much of it is too inferior to be of any service.

There is also an area of about two thousand square miles of coal measures in Natal, but only a fourth of this extensive area is estimated to represent productive coal fields. Then again, less than a third of this area contains workable coal, and much of this is unserviceable. The result is, that in Natal, only a very limited area indeed carries coal of what is considered as standard quality for shipment and market purposes, there being less coal of standard quality in Natal than of the Witbank coal field standard in the Transvaal. In Natal most of the coal is too anthracitic to be considered to be of any value to-day.

The coal resources of the Cape Colony are very limited, being confined to the Stormberg beds, where the coal occurs in such an irregular manner that a reliable estimate is very difficult to make.

The following is an estimate of the coal resources of the different Provinces reduced to figures, showing the probable number of marketable tons of coal of different qualities as graded in the different Provinces to-day:—

TRANSVAAL.

	Tons.
Witbank, Theoretical Calorific Value, exceeding 12	529,920,000
Second Grade Theoretical Calorific Value, from 10 to 12...	5,093,092,000
Third Grade Theoretical Calorific Value, from 7 to 10	576,000,000
Total Tons of available Coal under to-day's conditions	6,199,012,000

ORANGE FREE STATE.

Theoretical Calorific Value, over 9 (say) ...	1,000,000,000
Theoretical Calorific Value, from 7 to 9 ...	4,529,000,000
Total	5,529,000,000

NATAL.

Standard Quality Theoretical Calorific Value, over 13	290,000,000
Second Quality Theoretical Calorific Value, between 12 and 13	340,000,000
Third Grade Semi-Anthracite, unmarketable to-day	Not estimated.
Total saleable coal	630,000,000

The Cape Province probably contains one hundred and fifty million tons of coal, but it is much too inferior in quality to be classed with even the third-grade qualities of coal of the Natal and Transvaal, and may be considered to add but little to the coal resources of South Africa. In all the other Provinces there are considerable tonnages of coal superior to Cape coal altogether left out of the above estimates as unsaleable to-day, but which in the distant future may be of some value.

Several estimates of the coal resources of the Transvaal have been made, but they have not attempted to classify the coal as to quality based on present-day conditions. A writer in " New South Africa " estimated the quantity as sixty thousand million tons by taking an average thickness of ten feet throughout. As there are large areas included in this estimate where no coal exists, and other large areas where the coal is not saleable, it errs considerably on the side of area. Ten feet is also an excessive thickness to take, even if all the coal, inferior and otherwise, is to be included.

Mr. R. N. Kotze, the Government Mining Engineer, in his address before the local Institute of Engineers, in August, 1911, took the area of the coal fields at five thousand square miles, with an average thickness of six feet, and allowing fifty-five per cent. for extractable, saleable coal, fixed the total at twenty thousand million tons. This area is excessive, and makes inadequate allowance for a somewhat extensive area where no workable coal has been proved. An average thickness of six feet of saleable coal is also too much to expect over such an extensive area, but this estimate is far nearer the mark than the one contained in " New South Africa."

If, however, only saleable coal under to-day's conditions is to be counted, this estimate is about three times too great, but in the future, as conditions change, a more inferior coal will perforce be used. Under this classification will come much of the coal now left as roof coal on account of its inferior quality, and some of the so-called anthracitic coal in the neighbourhood of Delmas and the inferior coal near Belfast and Komati Poort. The most striking feature of the Transvaal coal fields is the large proportion of coal resources inferior to the present Witbank standard quality.

The Orange Free State coal fields carry, for the most part, a second-grade coal which, under existing conditions, does not find a ready sale.

The Natal figures are interesting because they show how, after all, the coal of present standard, for shipping purposes, is really of very limited extent, and the really small proportion of saleable coal to be found in such an extensive area covered by the Karroo formation. Even under the present method of working, it is doubtful whether anything like the estimated tonnage of coal of to-day's standard quality will be worked in Natal, where to find an attractive coal field of this description is not an easy matter. The resources of semi-bituminous and inferior anthracitic coal, unsaleable to-day, are, however, very extensive.

Probable Life of the Coal Fields.

The " life " of the coal fields depends upon so many future conditions that it is impossible to estimate the duration of the coal supply. Generally speaking, since the gold mines got in proper swing after the war, the output of coal has doubled itself in ten years, and there seems every prospect of this condition of affairs being continued. If an adequate reduction be made on railway rates for export coal, then the increase will be even more marked, both in the Transvaal and Natal. There is, however, one thing certain, and that is if the same practice exists as to-day of working as much of the coal of the Witbank standard of quality as possible, this quality of coal will be long exhausted before the Rand, and the mines will be running on coal of second grade. The same thing will happen in Natal as regards bunker and export coal, the supply of which is smaller than generally admitted. Fortunately, however, both the Transvaal and Orange Free State possess large reserves of second-grade coal quite good enough for general purposes, even when the supplies of Witbank standard quality have been exhausted.

FURTHER FACTS ABOUT GERMANY'S AFRICAN COLONIES.

Industries and Railways in East and South-West Africa—The Dark Continent and the Redistribution of Power.

In the war now raging in Europe four of the chief Powers owning territories in Africa are engaged, and it is certain that as an outcome of this colossal conflict there will be very considerable readjustment of African possessions and protectorates. Indeed, next to Europe itself, Africa promises to witness more important redispositions of territorial influence than any other continent. Africa is now divided up amongst seven European Powers—Great Britain, France, Belgium, Germany, Portugal, Italy, and Spain, whilst there are in addition the independent native states of Liberia and Abyssinia. Of the seven Powers ruling in Africa the four first named are now actively engaged in the European conflict, whilst Portugal, though not a belligerent, has expressed her intention of strictly adhering to her treaties with England, and Italy and Spain have declared their neutrality. The possessions of these two latter Kingdoms are unimportant. It is not our intention here to attempt any forecast as to the colouring of the map of Africa after the governing Powers have concluded treaties of peace, but it is common knowledge that Germany has, for many years past, set covetous eyes on the African Continent. Teutonic ambition in regard to Africa was well brought out in the diplomatic conversations immediately preceding the outbreak of hostilities. Thus the German Chancellor, in reply to Sir William Goschen, the British Ambassador in Berlin, stated that Germany in return for an assurance of British neutrality would guarantee the integrity of France, but declined to give a similar guarantee in respect of the French colonies. It will also be recalled that one of the threats held over the head of gallant little Belgium by Germany, when a passage for the Kaiser's armies through the kingdom was demanded, was that Germany would wrest the Congo from her in the event of refusal. Whilst not attempting, then, to forecast the probable redistribution of territories, it should at least be of interest to refer to lines of communication, river and steamboat services and industries in territories which immediately adjoin the Union of South Africa and Rhodesia. Of course the possessions which possess the greatest measure of interest for British South Africa are the two Germany Colonies of South-West and East Africa. In our last issue we dealt at some length with the mineral industries of these two territories, and we now propose to devote some space to a consideration of railway routes, inland steamship services and subsidiary industries, etc., of these territories, and to show how they impinge on our own possessions. In regard to German South-West Africa, the principal industries are, as was remarked in our last issue, diamond winning and base metal mining at Tsumeb; in addition there are considerable stretches of good agricultural and pastoral country in the interior.

British Companies in German South-West Africa.

The principal British companies operating in the territory are the Kolmanskop Diamond Mines, Ltd., and the South African Territories, Ltd. The former company acquired from the Deutsche Colonial Gesellschaft a 50-year lease of about 10,000 acres, about one-fourth of it so far proved to be diamond-bearing ground, about six miles from Luderitzbucht, in German South-West Africa. The report to December 31, 1913, set out that the profit for the year was £36,365 against £39,146 for 1912, £38,616 for 1911, and £57,522 in respect of 1910. All diamonds obtained are sold through the Regie Company, Berlin, which has the sole right to sell the production of the German South-West African mines. The latter company, of which Mr. Scotland, who it is reported has been arrested by the Germans on a charge of high treason, is manager, has mineral rights over about 30,000 square miles in German South-West Africa, and 128 freehold farms—about 2,700,000 acres. Mines discovered and worked before October, 1917, are the property of the company in perpetuity. Royalty to Government, 2 per cent. on precious stones, gold and silver; 1 per cent. on other metals. Diamond discoveries were reported in 1909. In August, 1910, advice was received from Keetmanshoop that expedition had discovered ore deposits assaying 10, 24 and 36 per cent. copper contents, also bismuth, mica and corundum. The copper lodes discovered on the company's property have not proved payable to work, but it is contemplated to form subsidiary companies to work galena deposits at Aiasis, and wolfram deposits at Klein Kharas.

German South-West Africa is fairly well served with railways. There are three main lines from the coast into the interior. Two of these commence at Swakopmund. The northern continues through Omaruru to Otavi, whence one branch goes to Grootfontein and the other to the Tsumeb mine. The second continues in a north-east direction to Karibib and then circles around south through Windhoek, Rehoboth and Gibeon to Keetmanshoop. The extreme southern line starts from Luderitzbucht and continuing through Seeheim links up with the Windhoek-Keetmanshoop railway. From Seeheim a railway runs due south to Kalkfontein from which point a line has been under construction to Warmbad, not far from the Orange River border. A scheme was under consideration some time ago for continuation of the railway from Keetmanshoop to Rietfontein on the border, whence a line might at some time be extended to Kuruman. The principal point of interest in connection with these German South-West African railways, from the point of view of the Union, has always been the possibility of linking up the Union Railways with the coast and thereby relieving the ocean distance to Europe. There would, however, be serious objections from the point of view of the Cape Peninsular to such a scheme.

Industries, Railways, etc., in G.E.A.

From German East Africa the principal exports are sisal (fibre) growing, cocoanut oil, hides, ivory, wax, and other tropical and sub-tropical products. The greater part of the white population is official. As supplementing the information given last week in regard to railways, it may be recorded that at a meeting of the Wirtschaftlichen Verband of the northern districts of German East Africa, held on June 9 at Tanga, German East Africa, an interesting discussion took place on the subject of railway communications, which, from the point of view of its bearing upon the development of the northern portion of the colony, may be regarded as being of general interest. The following are some of the principal extracts which have been translated from the *Usambara Post*:—"We in the north of our colony are of the firm belief that a continuation of the Usambara Railway to the Victoria Lake will remain an unfulfilled dream of the north, in consequence of the building of the Tabora Ruanda Railway, which is the natural continuation of the Tabora-Victoria Lake Railway. It was further admitted that through indefinite decades it will be proved that the Tanganyika Railway and the Uganda Railway, but especiallly the latter, which contemplates laying a second line, will be sufficient to absorb the traffic and commerce of the great lake. While the Tanganyika Railway will not come into consideration as regards goods and passenger traffic, the Uganda Railway is the leading factor in that respect. In economic life stagnation means decline, and this also applies specially in the development of a country. It is evident that a junction between the Usambara Railway and the Uganda Railway would result in a traffic connection which would be a powerful factor towards the development of Northern German East Africa. Above all, the junction of Moschi-Voi would lead to an excellent connection with the great lake and the coast, which would be of special advantage to the passenger traffic of the Usambara Railway, and would also give an impetus to the goods traffic. In other words, it would bring capital into the country, and would remedy the existing evil of the isolation of the north from the Victoria Lake. The low freights to that place would be a great advantage to commerce. The Uganda Railway would further enable a branch line to be built to the German Economic Territories situated on the German-English frontier, which, without a railway, lie fallow, but could be most practicably opened up by branch railways from the English side. The country would thus receive a valuable economic element in the form of really big farmers from Germany, whose presence we have missed so far owing to a want of the spirit of enterprise. From a political-strategical point of view it is quite indifferent whether these few kilometres divide us or not. Frontier railways exist also in the old country, although political argument there is of considerably more importance than in German East Africa. Further, it must be considered that frontier traffic was already taken into account in the supply of rolling stock to the Usambara Railway; and a smooth bridging over of the connection could therefore easily be effected. After a short debate it was resolved to direct an inquiry to the Secretary of State (Dr. Solf) as to whether the continuation of the Northern Railway is even under consideration, and whether the proposition of the Economic Union meets with approval. The ground for this inquiry was the well-known fact that the statement was made by the German Colonial Office in the Reichstag that, with the concession for the Ruanda Railway further railway demands for German East Africa would, for some time, not be made, especially as the State is already sufficiently burdened with the payment of interest on railways. This is certainly a fact, and it is therefore only right if the necessary tract of about 40 kilometres to the English frontier were added to the Uganda Railway. This would certainly result in an increased payments of interest by the Usambara Railway." The southern railway (Dar-es-Salaam—Tanganyika) reached Kigoma this year, and is a most important link in the chain of railway and steamship communication from the east coast to the west that Belgium and Germany have been working at for several years past. As to inland shipping on the Lakes which bound German East Africa, it is worthy of note that there are German armoured steamers on Lakes Nyasa and Tanganyika and an aluminium pinnance on Victoria Nyanza. Cables received here during the week report the capture of the German armed steamer "Wissmann" on Lake Nyasa by the British ship "Gwendolin."

MINING MEN AND MATTERS.

Sir John Swinburne, the seventh baronet, died recently, at Capheaton, his seat near Newcastle-on-Tyne. He was in his eighty-third year. An old Navy man, he travelled much in South Africa, and he was a cousin of the poet. Formerly Liberal member for Lichfield, he seceded on the Budget of 1909. His third son, Mr. U. P. Swinburne, is the Chief Inspector of Mines in the Union.

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It is notified that the Commission of Examiners for Mine Managers' Certificates of Competency will hold the next examination on Wednesday, Thursday, and Friday, the 23rd, 24th, and 25th September, 1914, at 9 a.m., at the South African School of Mines and Technology, Eloff Street, Johannesburg, and also simultaneously at Dundee, Bloemfontein, and Kimberley, if a sufficient number of candidates present themselves. The prescribed form of application for examination is obtainable without payment by applying to the Secretary to the Commissions of Examiners, P.O. Box 1132, Johannesburg.

New Vaal River Diamonds.

During July, 380 diggers on the estate of the New Vaal River Diamond and Exploration Co., Ltd., produced 3,014½ carats of diamonds, which realised £15,002 5s.

UNDERGROUND STAFF OF THE VILLAGE MAIN REEF G.M. CO.

Botton Row (left to right).—T. Moore, shift boss; F. E. Ellwood, shift boss; J. Chilton, mine captain; A. Murrish, mine captain; F. Shand, surveyor; J. Glasson, shift boss; J. W. McNicol, shift boss.
Second Row.—W. Hawthorne, shift boss; C. Black, chief sampler, H. W. Campbell, sampler; J. Singleton, boss timberman; E. Wright, boss sandfiller; J. Polige, shift boss.
Top Row.—L. A. Ferguson, sampler; P. A. Lowe, assistant surveyor; J. Watson, shift boss; A. Nancarrow, shift boss; R. Leng, shift boss; J. Wilkinson, shift boss.

Electrical Accidents.

The report of Mr. G. Scott Ram, the British Electrical Inspector, on electrical accidents is always interesting, not only on account of the personal application which it possesses, but also because of the interest which attaches to the details of the accidents themselves. In spite of the constant increase in the use of electricity, the number of mishaps in electrical stations was no greater last year than it was five years ago, and there were only three fatalities, apart from non-electrical accidents. As usual, the switchboard was the scene of the great majority of accidents, a fact which fully justifies the attention given by the Home Office Inspector to this part of the plant; and, again as usual, many of the accidents might, and should, have been prevented by proper care and foresight, which are not always exercised even by experienced engineers. A singular case was that in which a coil of wire curling round a doorway made contact with live metal in another room; and it is surprising that engineers should attempt to handle live oil switches, as they did in three instances. There was a serious increase in accidents in factories, with no fewer than 17 fatalities, and the Inspector points out that many of these were due to the lack of skilled supervision, while others were caused by apparatus of faulty design or manfacture, and by disregard of the Home Office Regulations. The electric furnace appears this year in the list for the first time, we believe, a man being severely injured with a pressure of only 60 volts alternating. The accident to a labourer who managed to reach over a screen 6½ ft. high in order to brush high-pressure apparatus, with which he had no concern, while it shows excess of zeal, also indicates that the most careful precautions are unavailing to keep some people out of trouble. Falls from cranes and other elevated apparatus due to shocks occur with regrettable frequency, and very often with fatal results. A disturbing feature of the latter portion of the report is the evidence of careless design on the part of the engineers responsible for the lay-out of plant. Narrow passage alongside of live metal, oil switches connected to bus-bars without isolating switches, and dangerous fuseboards, are mentioned; we note that one three-phase installation at 110 volts, "put up by a foreign firm of contractors, was dangerous in almost every conceivable way." We are glad to learn, however, that in many stations and works attention to safety has been the first consideration, and many supply engineers are taking pains to see that their consumers' apparatus is in accordance with the requirements. Of the 20 fatalities due to electricity reported in the United Kingdom last year, no fewer than 12 occurred through shock from low pressure systems (not exceeding 250 volts).

"SAFETY FIRST": PREVENTION OF ACCIDENTS.

Details of Important Suggestions.

At the suggestion of the Prevention of Accidents Committee of the Rand Mutual Assurance Company, Ltd., the managing secretary of that body has addressed mine managers on the following subjects, inter alia:—

Explosive Boxes.

It is highly desirable, he writes, that the boxes used by natives underground for storing their explosives should be of a type which will prevent the contents being inadvertently set alight by having a lid which is preferably fireproof and has no crack on the top. Several cases have arisen in which accidents have happened through explosives in these boxes being set alight. One suggestion has been made and is already being acted upon by a large group that these boxes should be [illegible] shaped at the top, so as to prevent workers sitting upon them or placing a lighted lamp or candle on the top of them. Several types of these boxes were exhibited at the Mining Exhibition in May last, one of which was highly commended, having a flat-top lid of sheet galvanised iron. It is understood that these boxes can be supplied at a cost of about [illegible] each. No recommendation is made as to any particular type which should be adopted; that is a matter which is left to the individual discretion of managers, but it is urged that the subject of providing as suitable boxes as possible is one of importance.

Trucks on Incline Planes.

A considerable number of accidents happen through trucks which are used on incline planes inadvertently running away. One method of providing against such runaways when these occur in the breaking of a coupling is to have a safety chain run from the last to the first truck. An additional safeguard is to have a pronged sprag on the last truck which trails on the ground and comes in contact with the sleepers or the rail should the truck inadvertently go backwards. Kickers or catches which allow the truck to go up but not to come back unless the catch is depressed are also well known devices. Managers are, of course, aware of these things, and in most places, no doubt, some or all of these devices are in use, but, in spite of these, accidents are constantly occurring, and this is very frequently due to the fact that these devices, although available, are not used. The catches specially designed to stop trucks going back have been found to be put out of use by the insertion of a stone underneath them, and managers are, therefore, urged to see that not only are these devices installed, but that they are kept in constant and efficient use.

The Managing Secretary of the Rand Mutual adds:—"I am particularly requested to state that, while the above suggestions deal with matters of detail, the Prevention of Accidents Committee have no desire to adopt, or even to appear to adopt, the attitude of instructing managers in their work. The suggestions are made solely with the object of calling the attention of managers to some of the ideas that have been put forward by practical men as the result of recent actual experience, and in the hope that these ideas, which some have found useful, may be of benefit to and will assist managers in the safety campaign against accidents. The widest discretion must, of course, be used by every manager in the extent to which these suggestions are capable of being adopted and the methods to be used in making them effective, and it is no less admitted that on many mines these suggestions may already be in efficient use. The Committee will welcome any further practical suggestions, and continue to invite managers to assist with their hearty co-operation, which is absolutely essential for the success of the work.

A practical mining examination of six students from the Government [illegible] School at Wolhuter G.M. Company has recently taken place. The examination was undertaken by the manager [illegible] of the Nourse Mines, Ltd. The students were examined [illegible] timbering of stopes [illegible] more especially with regard to the prevention of [illegible], handling of explosives, and general [illegible] handling of natives and general conditions. The examiners were unanimous in their opinion that the knowledge of the six students as a class was [illegible] good, and they report that the students are thoroughly well grounded in general mining work. It was also stated that the students were particularly strong in [illegible] and should, with a little more experience, which they are now well fitted to acquire [illegible] to the young industry. The students have recently completed the three years' course [illegible].

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Consolidated Langlaagte.

The net profit earned by the Consolidated Langlaagte was £70,719 15s. 9d. in the three months ended June 30. There was a marked improvement in the native labour supply during the quarter, and this permitted the full mill to be run. As a result the tonnage crushed was increased by 30,100 tons as compared with the previous quarter. Working costs were reduced by sixpence per ton, but as the recovery value was also sixpence lower the profit per ton remained unchanged. A smaller quantity of accumulated slime was treated owing to the demands made on the plant by the increased amount of current product, and the net revenue from this source was less by £1,200. The total gross profit, however, showed an improvement of £13,793. The development of the southern section continues to yield gratifying results. At the east shaft the tenth level station has been cut, and a crosscut started to the reef. The eighth and ninth levels are exposing ore of very satisfactory value, and at the west shaft the eighth level east on the South Reef is being extended in reef of high grade. Development to the west of this shaft has been more promising recently.

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MANAGERS - - - January and May - - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% „
MECH. ENGINEERS - June (Kimberley Centre) - - ALL „
MINE OVERSEERS - - - - - - - Practically ALL „
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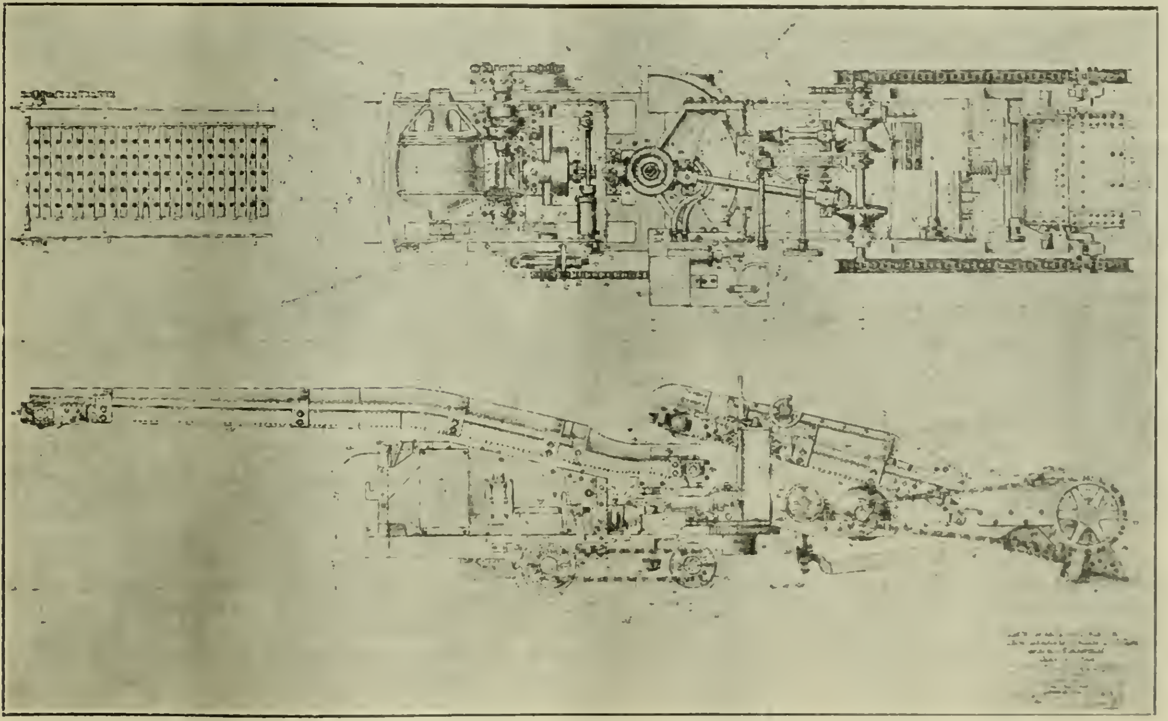
"MYERS-WHALEY" SHOVELLING MACHINES.

A Labour-Saving Device of Great Promise.

RECENTLY a new and important labour-saving machine has been introduced in America to facilitate the shovelling of broken rock, and it has since been introduced on the Witwatersrand in the new main drives of the Crown Mines, Ltd. The machine is known as the "Myers-Whaley" shovelling machine, and is specially adapted for cleaning out drives, loading coal, or for work in big stopes, where large ore tonnages have to be dealt with. We give below a table showing the leading dimensions and characteristics of this machine, and also general description:—No. 4 type of underground machine: Principal dimensions: Weight, about 8 tons in working order. Track gauge, 24, 26, 28, 34, 36, 42 ins. and over; balance rails used on gauge less than 42 ins. Length, 22 to 26 feet, depending on length of mine car. Width over all, 5 feet 4½ inches, with front control. Height, 4 feet 6 inches and upwards, depending on height of mine car. Wheel base, 38½ inches. Reach, 10 feet to each side of centre of track. Width of shovel, 31 or 34 inches. Power consumption, about 15 h.p. Motor, 20 h.p. for any commercial electric current. Capacity, 41 to 45 cubic feet per minute in loose material (12 r.p.m.). Largest piece handled, 1,000 lbs. weight. This machine is designed for mines or tunnels 6 feet and over in height. The rear conveyor swings laterally and will load cars on same or parallel tracks. This machine, under ordinary conditions, in a 6½ foot seam of coal, averages 24 to 26 tons of coal per hour, including shifting of cars and moving of machine. In red hematite iron ore the machine averages about 40 tons per hour actual shovelling time, not counting time required to shift cars. In lead ore this size is averaging 180 to 200 tons per 8 hours shift. The rock machine of this type averages 10 to 12 yards per hour, including the shifting of cars in a rock tunnel. The machine "mucks out" a 14 feet 6 inch diameter tunnel in 4 hours, including shifting cars and other usual delays. On the Crown Mines this machine is working in a 12 ft. by 10 ft. drive and is cleaning out 35 to 40 two-ton car loads in 3 to 3½ hours. A two-ton car can be loaded in 95 seconds and the speed of working is only restricted by bringing up the cars at the back of the rear conveyor to be filled, promptly. The machine is electrically driven, but can be supplied to be driven by petrol motor, compressed air, or steam, as desired. It consists of a four-wheel truck on the front end of which is the shovel, which is driven from the motor by means of a chain drive. The whole shovel can be swung about a point 8 feet on either side of its centre line, so that a drive can be cleaned out 16 to 20 feet wide. The rear conveyor can also be swung about a fixed centre through the same distance, so that material can be delivered on to three lines of trucks, if desired. The whole of the movements of the machine are controlled by means of levers and wheels, operated by a man seated to one side of the machine. In action the shovel is swung backwards and forwards by means of a crank and hinging at the back of the shovel is a small bucket which runs in guide ways to deliver the broken material on to the incline conveyor, and this conveyor delivers again on to a horizontal conveyor, which delivers into the trucks. The machine is made in four sizes, but the size mostly suitable for the conditions on the Witwatersrand is considered to be the No. 4 size. The whole of the workmanship is first-class, and all gears are cut from the solid and all wearing parts are case-hardened and ground, and most of the chain drives are provided with gear cases. This machine is used in America in the coal, rock salt, and lead mines, and in one of the latter mines it has handled as much as 9,000 tons per month. A machine has also been installed in the Rio Tinto Mines, Spain, where it is handling 250 tons of material per day.



Rhodesian Section.

LATEST MINING NEWS.

The Golden Kopje—Eldorado Banket—Eileen Alannah—Somabula Diamonds—Oceola Gold Mine—Eiffel Blue—Rhodesia, Ltd.—Native Labour Questions.

The report of the Golden Kopje Proprietary Mines, Ltd., contains, *inter alia*, the following information:—The capital of the company remains the same as in last year's report, namely, £500,000, divided into 500,000 shares of £1 each, of which 448,568 shares have been issued and 51,432 shares are held in reserve. The company's claim area remains the same as in last year's report, namely, 526 claims, and the company owns the Golden Kopje farm of 1,500 morgen, together with certain dam and water sites comprising five acres. The ore reserves remain the same as in last year's report, namely, 310,746 tons, of an average assay value of 8 dwts. During the past year the main shaft was sunk to a depth of 286 feet, and stope driving has been carried on and other preparation made for regular stoping. No development or exploratory work has been done, the efforts of the management having been concentrated on the erection of machinery and plant, with a view to bringing the mine to the productive stage at the earliest possible date. In consequence of delay in the forwarding of some of the most important portions of the plant, a trial run of a section of the plant could not be made until June 20th. It is now anticipated that a trial run of the complete plant will commence this month, and that the same should be in full running order early in August. The attention of the shareholders has already been called to the fact referred to in the engineer's report, that owing to the usual preliminary absorption of gold in the tube mills, zinc boxes, etc., the total amount of gold called for will probably not be recovered during the first few months of crushing. Owing to the considerable postponement of active operations, which has entailed some additional expenditure, it will be necessary to further finance the mine during its unproductive stage; it is estimated that about £21,000 will be required over and above the funds available before the mine becomes self-supporting, and arrangements will be made to provide for any temporary deficiency.

* * * *

Cable advice [illegible] [illegible] [illegible] week from Bulawayo stating that the pay shoot on the No. 13 level of the Eldorado Banket is 65 feet long, averaging 20.1 dwts. over 120 inches, the length is fully exposed, and the shortness of the shoot is due to a dyke which is not likely to affect the next level to nearly so great an extent and lower levels probably not at all.

* * * *

Tenders have been received for an entirely new plant for the Eileen Alannah mine, capable of treating from 5,000 to 6,000 tons a month, and the whole of the cyanide plant has been ordered, amounting to more than one-half of the plant, and should be installed by the end of October next. It is intended to give the order for the remainder of the plant very shortly, so that the whole plant should be operating in the earlier part of next year.

* * * *

During the year ended the 31st December last the diggers on the Somabula area recovered 700 carats of an estimated value of [illegible], the largest stone weighing 30½ carats, realising £743 15s. There are still expectations of ultimately finding a payable pipe on this area, and quite recently an arrangement has been entered into with a prospector, with the object of carrying on exploratory work in depth.

* * * *

The directors' report on operations on the Oceola Gold Mine, [illegible] at the annual meeting held in Salisbury on the [illegible] inst., reads as under:—It will be seen from the balance sheet that, after writing off £1,116 18s. 1d. as depreciation from building, machinery, plant and tools, a net profit has been earned on the year's operations amounting to £4,009 0s. 6d., making, with the amount brought forward from last balance sheet, a total of £4,748 9s. 2d. at credit of profit and loss account. During the year under review, dividends have been paid amounting to £1,296 11s. 3d., or 22½ per cent. of the issued capital. The total dividends paid to date amount to 42½ per cent. of the issued capital. Development account has been increased from £250 to £2,409 19s. 4d., which shows that a large proportion of the profit earned has been sunk again in development. £1,082 1s. has been spent on plant. The total expenditure in this department has been £4,843 15s. 11d., of which approximately £3,000 has been supplied from profits. Although the directors feel that the dividends paid during the year have been most acceptable to shareholders, they realise that it would have been better to reserve this cash against the better development of the mine. It is proposed to forthwith write off the whole of development account, which has up to the present proved such a misleading item in the company's accounts, and for the immediate future treat development as part of the working expenses. The directors fully realise the necessity for adopting a policy of the utmost economy, and during the past few months steps have been taken to effect this desirable change. At the beginning of June Mr. G. Fullerton resigned and Mr. Lannin was appointed manager in his place. The board has every confidence in Mr. Lannin, who has already instituted several much needed reforms. Mr. W. M. Epton has resigned his position as consulting engineer, and the directors feel that it is not necessary to employ an engineer on a fixed salary. Should it be deemed advisable, they propose to engage an engineer to report and advise periodically at a fee for each visit. A considerable saving has been effected in native wages, and the meal contract has been renewed at a very favourable price, which will be the means of saving a further £150 per annum. From the engineer's report you will see that the prospects of the Tat Reef are better than ever. The report deals fully with the position at the mine. In conclusion, the directors beg to assure you that the prospects for the current year are most promising, and would ask shareholders to be patient in the matter of dividends until the financial position of the company has been considerably strengthened.

* * * *

The report of Willoughby's Consolidated to the 31st December last, just issued, contains the following reference to the Eiffel Blue mine:—17,918 tons were crushed during the year, yielding 7,744·64 ozs., realising £32,603 12s 6d. The net profit, after providing for depreciation, development redemption, etc., amounted to £7,140 1s. 6d. During the year the main shaft was sunk a further 126 feet to a total depth of 875 feet, at which point the opening up of the 7th level was commenced. Driving on the lateral extensions of the reefs has been undertaken on all the levels, with fairly satisfactory results.

* * * *

During June, 101 feet of development were executed at the Sabiwa mine, Kopje section. Shaft No. 4 was sunk 28 feet, making its total depth 553 feet, and should cut through the dyke during July. The 4th level drive south, winze No. 1 to 5th level, crosscut west, at depth of 145 feet, was extended 10 feet; the hanging wall has been reached. The crosscut east was extended 7 feet and is still in the lode; 17 feet of reef exposed altogether. The central section assays 11 dwts., but the balance is not payable. Driving from the winze will begin shortly. No. 1 level south, winze No. 1, has been sunk 20 feet, total 33 feet. The average

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assay value over the section of reef exposed is 11½ dwts. The winze should result in increased ore reserves in the Kopje section. Driving has been resumed in the 2nd level south. The prospects of the Magana claims are encouraging.

* * * *

Government Notice 248 of 1914, recently framed and gazetted, contained the following clause :—" Except on mines where no night shifts are worked, all native labourers shall be given at least one day's rest in seven." This is held by the leaders of the industry to be irksome and economically impracticable, and last week a conference between representatives from the Rhodesia Chamber of Mines, the Rhodesia Small Workers' and Tributors' Association, the Chamber of Mines, Salisbury, Secretary for Mines, and the Medical Director, was held in Salisbury to consider the matter. A committee of the various bodies mentioned had, in the meantime, drafted the following resolution :—" Resolved that the Government be informed that this meeting of representatives of the Mining Industry of Rhodesia regret that they cannot see their way to recommend the acceptance of the provisions of this clause, as, in their opinion, the regulation is unnecessary and would prove unworkable in practice." Mr. Montagu said the regulations embodied in the Notice were drawn up in pursuance of the Report of a Government Commission, held in Bulawayo in August, 1913, to consider and report upon the mortality rates prevailing amongst mine labourers, recruited in Northern Rhodesia, of which copies had been supplied to the Chamber of Mines and the Small Workers' Association, from all of whom replies had been received commenting on the Report. With reference to this particular clause, the Rhodesia Chamber of Mines had expressed its approval of the principle of one day's rest in seven for natives working on mines. Mr. Wrey explained that when the Commission's Report was considered by his Chamber the recommendations therein were regarded as being purely academical and were replied to as such. The Rhodesia Chamber were in favour of the principle, but its compulsory application to practice was quite another matter. The Chairman pointed out that the Commission's Report referred to natives recruited in Northern Rhodesia, and when it was circulated, the Industry did not take it to deal with all natives employed on Rhodesian mines. Further, that the personnel of the Commission did not include a practical mining man, and in view of the objections raised this Chamber had been given to understand that the Report would not be acted upon. Mr. Montagu said he understood that, as a matter of fact, natives on mines in Southern Rhodesia almost invariably took four or five days' holiday per month, but Mr. Wrey, whilst admitting that such was the case, said it was a very different thing to making the granting of one day in seven compulsory. He feared difficulties and inconveniences would result, and sincerely hoped the Administration would withdraw the clause.

Engineering Notes and News.

THE ECONOMIC USE OF WORKMEN ON THE RAND.—V.

Continuation of Mr. E. J. Way's Thoughtful Paper.

Underground Workers.—There were 218 Europeans employed during May, 1914, and their earnings amounted to £6,907 7s. ; 149 of this number, equal to 68.35 per cent., could be displaced by coloured labour, effecting a saving of £3,548 11s. 3d. per month, or 1s. 4.160d. per ton milled. Surface Workers.—242 men were employed in May, their earnings amounting to £6,833 16s. 5d. ; 133 of these men, equal to 54.95 per cent. could be displaced by coloured labour, effecting a saving of £2,439 10s. 2d. per month, or 11.110d. per ton milled. Total Workers.—Of the 460 Europeans employed during May, it would be practicable to displace 282 of them by coloured labour, equal to 61.30 per cent. The saving in wages would amount to £5,988 1s. 5d. for the month, equal to 2s 3.270d. per ton milled. In no cases have the wages either for white or coloured been reduced, and wherever black or coloured skilled labour has replaced white, an all-round wage of £6 10s. per month, including food, has been allowed. This allowance is on the high side. It is also necessary to add that in this statement the position of all white learners and apprentices has been safeguarded. It will thus be seen that if we could approximate to the practice in other parts, the saving in cost per ton should be 2s. 3.27d. With regard to the mine on the Rand, this is not by any means the only saving that can be made, for it has been quite impossible in the scope of this address to endeavour to estimate closely the saving that would accrue from the increased efficiency of the individual black or coloured unskilled unit by making pay commensurate with the task, and giving every inducement to increased effort, but rough calculations show that such a saving might easily approximate another 9d. to 1s. per ton. The Witwatersrand mines, during 1913, milled 25,628,432 tons, which, at 2s. 3.27d., represents £2,912,030. A further sum for increased efficiency, apart from actual transference of black for white, amounts to £1,281,421, or a total of £4,193,451 for one year. This sum is sufficient to develop and equip several mines on the eastern unexplored area. No allowance is made in the above statement for ameliorating the burden of taxation, direct or indirect, under which the industry labours. The awards made under the Miners' Phthisis Act to be paid directly by the mines, amount approximately to £700,000 for 1913. A considerable portion of this amount should be paid by the Government and collected from the rest of the population, who thrive on the mining industry. In addition to the above probable savings, consideration may be given to the actual cost of recruiting, which, it is thought, may in time be entirely done away with in its present form, all expenses incurred in assisting the native to get to the place of work being refunded by him, as at Kimberley. The Witwatersrand industry spent, roughly, £600,000 in recruiting last year, all of which was a direct charge upon the mines. If this could be saved, working costs could be reduced by a further 5.6d. per ton. The evidence given by the Chamber of Mines *re* the future of *the present producing mines* showed that the present rate of production could be maintained for about five years with working costs at about 18s., and that subsequently there would be a gradual decline. Working costs are now on the average a little over 17s., and a further reduction of 3s. would prolong this position to some extent and would bring certain mines, shut down when the estimate was made, again to the producing stage. It would also encourage the opening up of the unexplored areas referred to. Severe criticism has been passed on this evidence, but I can, from personal knowledge, state that the facts and figures presented, represent the most careful application of the best-tried engineers and mathematicians on these fields. (Chairman of all except one sub committee for the preparation of Chamber of Mines Evidence for Economic Commission, 1913.) The White Labour politicians would say " you are only putting more money into the shareholders' pockets ": that is true, but you are giving those shareholders who are also the white race some inducement to re-invest their increased profits in the enormous areas of unexploited mining ground, which would give work to a very large number of white people.

Rhodesian Mine.—With regard to the mine in Rhodesia, by adopting Rand methods a profit of £1,832 becomes £875, a reduction of 52 per cent. The statement giving details is as follows :—

WORKING COSTS.

	Rhodesian Actual Costs.				Rand Methods Applied.			
	£	s.	d.	Per ton.	£	s.	d.	Per ton.
Mining...	1,472	1	5	or 6 1.603	2,152	18	5	or 8 11.646
Milling & concentrates	486	12	0	or 2 0.330	505	4	7	or 2 1.261
Crushing, sorting and hauling	157	18	10	or 7.897	189	16	3	or 9.491
Cyaniding	328	18	6	or 1 4.446	343	6	4	or 1 5.166
Concentrates treatment	76	13	0	or 3.833	76	13	0	or 3.833
Slimes treatment... ...	259	10	9	or 1 0.977	259	10	9	or 1 0.977
General charges (controllable)	403	6	5	or 1 8.166	426	10	11	or 1 9.327
General charges (fixed)	352	6	5	or 1 5.616	352	6	5	or 1 5.616
Development redemption...	1,200	0	0	or 5 0.000	1,387	9	8	or 5 9.374
	£4,737	7	4	or 19 8.868	£5,693	16	4	or 23 8.691
Profit	£1,832	1	11		£875	12	11	

The difference in working costs is an increase of 4s. per ton, very nearly equal to the reduction that could be made on the Witwatersrand if Rhodesian conditions could be introduced here. The manager of the Rhodesian mine has taken a very conservative view of the position, and states that he has replaced " 10 native timbermen with 5 whites, and so on throughout." If he had replaced equal numbers, his profit would entirely disappear. The present artificial boundary between the labour of black and of white must break down, and unless the position be met in the proper spirit by politicians and sentimentalists, grave trouble may ensue. It may be said that it would never be possible amongst the black and coloured peoples to obtain enough skilled labour for all requirements, even in a long period. The

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RE DIVIDEND.

WITH reference to the advertisement in the Press, and dated 12th August, 1914, notifying the postponement of the payment of Dividend No. 17, the Directors have pleasure in advising the Shareholders that, in consequence of the arrangement arrived at between the Government and the Bank of England, the Dividend can now be paid. Warrants will, therefore, be posted as early as possible this week to Shareholders resident in all countries except Germany and Austria.

By Order of the Board.

H. G. L. PANCHAUD, Secretary.

Head Office, Johannesburg,
August 17th, 1914.

33108

Consolidated Main Reef Mines & Estate, LIMITED.

(Incorporated in the Transvaal.)

RE DIVIDEND.

WITH reference to the advertisement in the Press, and dated 12th August, 1914, notifying the postponement of the payment of Dividend No. 12, the Directors have pleasure in advising the Shareholders that, in consequence of the arrangement arrived at between the Government and the Bank of England, the Dividend can now be paid. Warrants will, therefore, be posted as early as possible this week to Shareholders resident in all countries except Germany and Austria.

By Order of the Board.

H. G. L. PANCHAUD, Secretary.

Head Office, Johannesburg,
August 17th, 1914.

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grievance of the skilled coloured man to-day is that he receives every facility in the Cape Colony to learn every kind of trade, and he has take advantage of this to the utmost, and when he comes to the Rand, where there should be the best market for his skilled labour, he finds himself barred by the law and custom, and very naturally complains of the rank injustice of it all. The position I have outlined must come about. It is the only way to bring true and lasting prosperity to the whole Union of South Africa.

The change to be effective must be very gradual. The result will be a gradual improvement in efficiency all round. It will also result in the elimination of both the white and black loafer, and in the reduction of working costs. The abolition of regulations restricting the coloured man from doing certain classes of work will do away with the sentimental barrier of colour as between working men, and will enhance the manhood of the white. And if the white man's heart be in the right place, it will urge him to the necessity of always maintaining his supremacy through his mental and physical effort alone. Under any circumstances these restrictions are unconstitutional and contrary to British ideals. Lowering of costs brought about upon a sound basis will be the cause of restarting shut-down mines, of bringing under exploitation the untouched payable areas on the Witwatersrand fields and other places known to exist and now idle for want of capital. It will place the whole British South Africa on a basis of sounder economy, for it is absurd to expect that the prosperity of the country is to depend upon the uneconomic exploitation of what is at best, a wasting asset. How many people realise to-day that the value of undeveloped coal probably exceeds that of any other mineral in South Africa? All industries would be affected for the better, and in the end, provided on these sound lines the white man maintains his supremacy, this country will be able to compete with other countries for the trade and food supplies of the world, and will support a larger population than has ever been dreamt of.

In conclusion, if what has been said to you is worth a second thought, do not let prejudice warp your better judgment. Do not let habit and sentiment stale your desire for better things. It was once, and not so long ago, customary and legal to hang a man for stealing a sheep. If there be laws and customs to-day which hamper the economic and scientific exploitation of one of the greatest industries in the world, my last word to-night is that these must be done away with, and as soon as possible.

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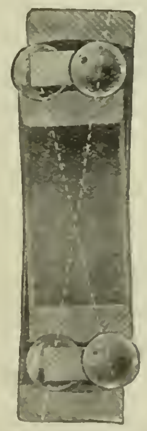

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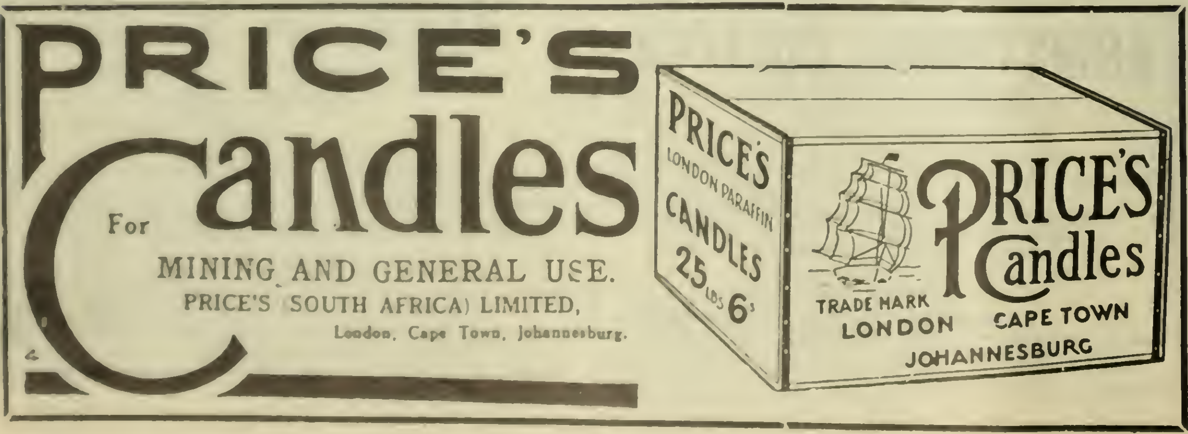

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CONTENTS.

PAGE
Notes and News 645
Topics of the Week:
  The Mines, Commerce, and the War 647
  Diamond Mines' New Arrangements 648
The Year with the Rooiberg Minerals 649
The Geology of German South-West Africa 650
Correspondence and Discussion: "Economics of Citrus Growing"; "War Relief Funds and Scientific Societies"; "The Exudation of Nitro-Glycerine" 651
Rhodesian Section:
  Latest Mining News 654
S.W. Transvaal Diamond Fields: July Output 655
British and German Commerce and Industries 655
Engineering Notes and News 657
  Mine Rescue Station Rules in Great Britain—II. 657
Mining Men and Matters 659
Finance, Commerce and Industries 660

Notes and News.

The School of Mines Closed.

So many of the students of the South African School of Mines have been called out to join the various units of the Defence Force, that it has been decided temporarily to close altogether. Those students who have not been called up have all been absorbed by the mines of the Consolidated Gold Fields group.

* * * *

Rooiberg.

In another part of this issue will be found extracts from the annual report of the Rooiberg Company. Included will be found a valuable detailed review of the position at the mine by Mr. E. J. Way, which sets out very succinctly all the essential facts. Since the report appeared the war, of course, has intervened to add to the difficulties of marketing the product.

* * * *

Dresdner Bank's Warning.

It is significant that in a pre-war issue, the *Frankfürter Zeitung* states that for some time it had been noted on the Berlin Stock Exchange that the depression was accentuated to a large extent by sales emanating from the clientèle of the Dresdner Bank. This fact has been confirmed by a declaration made by this institution to a Berlin newspaper, which mentioned that the Dresdner Bank feels unable to advise its clientèle to keep stocks in view or news received by this bank regarding the political situation. The *Frankfürter Zeitung* criticises sharply this declaration, and adds: "To assume such an attitude is to expose oneself to heavy responsibilities, and cause, at the same time, grave harm to the clientèle of other banks."

* * * *

Stock Exchange Closing Beneficial.

"Beneficial. It prevents panic." In these four words, addressed to a representative of the *Pall Mall Gazette* on the day the London Stock Exchange closed, Lord Rothschild summed up the whole feeling of the City on the closing of the Exchange. His lordship was asked for his view of the action of the committee, and this was his reply. "It is the only thing that could be done to stop an absolute financial panic," another well-known authority stated in an interview with that representative. "Let me," he added, "give you an illustration of the position:—Money, let us suppose, has been advanced to a firm of brokers, and amongst the securities that have been given for it are a thousand De Beers. A broker has an order to sell two hundred De Beers. He goes into the market and finds them at 14½. In trying to sell his two hundred he perhaps forces the price down to 12 before he can find a buyer. The people who hold De Beers as a security for the money that they have advanced see them down to 12, under these circumstances, and require more margin. As they hold a thousand shares they will want £2,000, and the firm to whom the money has been advanced are called upon to find the £2,000 through the action of a small man going into the market, in these times of panic, and selling two hundred shares. Multiply this illustration I have given you by thousands and by tens of thousands, and you will understand where the financial panic would come in if the committee of the Stock Exchange, after consultation, I believe, with the Bank of England—had not taken this essential step."

* * * *

Goggles to Protect Eyes.

The managing secretary of the Rand Mutual Assurance Company, Ltd., has written to the secretary of the Association of Mines Managers: "I am enclosing herewith copy of a page from the *S.A. Mining Journal*, dated 23rd May last, which my Committee think might be reproduced on stout cardboard and hung up in drill shops, batteries and other places where there is any particular danger from flying fragments of metal or stone, and if your Council is in agreement with this my Committee will be only too pleased to have these printed and widely distributed. The *Mining Journal* extract is taken from page 10 of Bulletin No. 4, of

November, 1913; pages 41 to 47 of Bulletin No. 3, of August, 1912, deal with the same subject. One copy of each of these Bulletins from the United States Steel Corporation are sent you herewith.

*   *   *   *

South African Oil Shales.

Oil and oil shales in South Africa are likely to have considerably more attention given to them in the near future than in the past, for several reasons. Most of the information regarding oil and oil shales in this country seems to be derived from London, where are the headquarters of one or two important companies which have for some time past been pushing developments in regard to the oil resources of South Africa, and in the issue of the *African World* to hand by this mail there is an interesting article which forecasts an assured future for the Impendhle deposits and deals with the economic possibilities of shipping the shale to Europe for treatment. Our contemporary states, *inter alia*:—There is no doubt that the very near future will witness a live and prosperous industry established in South African oil shale. Since the official visit of Mr. E. H. Cunningham Craig this oil shale has been the subject of considerable attention by some of the most eminent people interested in the industry. The value of the deposits is enormously enhanced in view of the result of investigations which we have to hand this week to the effect that a ready market already exists in this country for the material in its rough condition. Up to the present it has generally been supposed, or taken for granted, that a South African oil shale did not become of commercial value until a considerable sum of money had been provided for the erection of distillation and refining machinery. It has now, however, been ascertained that oil shale of a similar character to that existing in the Impendhle Valley can be shipped to this country and disposed of in such a way as to show a very handsome profit. The cost of raising the shale should not exceed that of ordinary coal mining in Natal, and for material giving a yield of upwards of 25 gallons to the ton there is a market in the United Kingdom for practically any quantity available at very remunerative prices.

*   *   *   *

The Defence of British Merchant Shipping.

Whatever may be the coming surprises in national defence, whether in larger or smaller fighting ships, or aircraft, the Admiralty do not intend to abandon any accepted practice of naval war without due consideration. The submarine may ultimately prove more devastating than the battleship, and the aeroplane than the submarine, but so far as the defence of British merchant shipping is concerned modern gunnery will not be thrown lightly on the scrap heap. Great Britain has a good deal to defend. She is the largest shipbuilder, she has the largest carrying trade, she is always penetrating to new markets and increasing her business. There are nearly forty thousand merchant ships afloat on the seas of the world and half of these are British. With the opening of the Panama Canal new possibilities will beckon shipowners, and many additional craft will be put upon the waters from British shipyards. Cargoes will traverse the new routes to South America, Australia, New Zealand, the Philippines, the East Indies, Southern Asia, China, and Japan, and the probability is that British trade will enormously develop and that British workshops will be busier. All this shipping, all this merchandise that flies the British flag, has to be protected. No fleet, however comprehensive, can do it without assistance from the merchantmen themselves. Consequently they are being armed with quick-firing guns to fight, or run and run as their commanders think wisest. Most of the great passenger and cargo boats are fitted with this armament, and the latest liner, the *Aquitania*, has been designed, with special watertight subdivisions and other devices, to safeguard her against ramming. She has been strengthened in many ways to resist gun fire, the special strengthening being chiefly on the port and starboard sides amidships, and she will, in emergency, be armed with no fewer than twelve quick-firing guns that should give a good account of their capacity.

Gold Fields Rhodesian Development.

The report of the Gold Fields Rhodesian Development Company, Ltd., for the year ended 31st March, 1914, submitted to the meeting on the 24th ultimo, states that the authorised capital is £3,000,000, divided into 3,000,000 shares of £1 each, of which 2,512,344 shares have been allotted and 1,876 shares are still due to the holders of fractional certificates. The balance of 485,780 shares is held in reserve. The realised net profit on the year's operations, after deducting all outgoings, shows a balance to credit of £104,026, about one-half of which is derived from dividends received on investments. The changes that have taken place in the company's holdings during the past year have not affected the general position or nature of the investments. In order that the position may be placed before shareholders as clearly as possible, it has been considered advisable to show the depreciation of investments from the date of the company's formation in the form presented in the balance sheet. This depreciation of £1,402,993 is thereby treated as temporary and adjustable according to market values for the time being. As stated in the last annual report, the company has been called upon to assist in financing its sub-companies to the productive stage, and in accordance with an arrangement made with the Consolidated Gold Fields of South Africa, referred to by the Chairman at the annual meeting in July, 1913, amounts aggregating on 31st March last to £277,000 had been borrowed from that company. During the past year the Shamva, Antelope and Bell mines reached the productive stage, and since then trial runs of machinery have taken place at the Falcon and Golden Kopje Proprietary Mines, both of which should come into profitable operation before the end of this year. The results so far attained at the Shamva mine are entirely satisfactory; at the Antelope and Bell mines there have been minor difficulties incidental to the starting of new plant and reduction works, but these are being gradually overcome.

*   *   *   *

Diamond Trade of Amsterdam.

According to a recent Consular report, 1913 was a most unfavourable one for the diamond trade and industry, and unemployment has not been so general for many years. The run of "malaise" in this most sensitive industry began as early as the end of 1911, and has continued and increased until the end of 1913, when it is hoped that it has reached its worst point. The causes of this affection may be traced in the main to the Balkan war and other disturbances in South-Eastern Europe, and the consequent *moratorium* in various belligerent States, which were of considerable influence on the European money market. The money market re-acted directly on the purchasing power of the European public, and the *moratorium* brought the trade itself into difficulties. Following upon this the United States of America raised its customs tariff, and uncut diamonds, which were formerly free, are now liable to 10 per cent. duty *ad valorem*, and cut diamonds from 10 per cent. are raised to 20 per cent. Buyers in the States ordered large quantities freely before the new duty came into force, so that practically no orders have come from America. The value of the exports of rough and polished diamonds to the United States of America was as follows:—First quarter, 1912, 5,116,000 florins; first quarter, 1913, 8,906,000 florins; second quarter, 1912, 9,017,000 florins; second quarter, 1913, 10,082,000 florins; third quarter, 1912, 7,180,000 florins; third quarter, 1913, 6,902,000 florins; fourth quarter, 1912, 5,300,000 florins; fourth quarter, 1913, not available. Another cause, which is even more serious and perhaps of a more permanent nature than those above-mentioned, is the practically unlimited supply placed on the market of German West African diamonds, which was aggravated by the methods at first employed. The present situation is most critical on account of the contract made by the German Régie with a *consortium* at Antwerp that the latter should accept during 1913 1,000,000 carats. The market during 1913 could not possibly absorb such a quantity, so that the evils of over production are being felt. The diamond industry at Amsterdam at favourable seasons gives employment to about 11,000 skilled workpeople, of whom about 1,600 are females. The industry is highly organised, as out of this number there are only 150 hands who do not belong to any union. There are four unions, the largest being the Algemeen Nederlandsch Diamantbewerkers Bond (General Netherlands Diamond Workers' Union), with a membership of 10,000, while the remaining three have about 850 members between them. All persons engaged in the diamond industry, however, whether organised or not, comply with the regulations of the largest union, so that the minor unions are only separated from the larger ones on religious grounds. It is noteworthy that the metric carat (200 milligrams) has now been made the legal weight for precious stones in the Netherlands, and will come into force on April 1, 1914. Although the law had been promulgated some time ago, it was not immediately put into force at the request of the Jewellers' Association at Amsterdam, so that the law would operate simultaneously in Belgium and the Netherlands.

* * * *

Criticism and the Commercial Exchange.

Mr. R. B. Greer, in his speech from the chair at the annual meeting of the Witwatersrand Commercial Exchange, replied to the many critics of that body. He said:—" It has frequently been charged against the Exchange that it unduly favours the small merchant. Well, it certainly does put the small trader more on an equality with the larger one on account of the facilities for selling which it affords to all its members. But as a country district is prosperous if there are a lot of small farmers settled in it and owning their own land, so I hold that a town community is flourishing if it contains a large number of small independent merchants. The other complaint against the Exchange which one hears repeatedly is that it cheapens prices. This is to a certain extent the case, as anything which expedites the dispatch of business always tends to lower prices, as the expenses of those running the business are less. I hold, however, that the low prices ruling during our last financial year were mostly brought about by other causes, namely, money from the mining groups, railway, etc., being always sure. The very large turnover of goods confined to a very small area, excessive foreign competition and the check to the expansion of the mining industry owing to industrial unrest."

* * * *

Gold Reserves to Equalise Yields.

The old question has been again raised, this time in London, as to the wisdom of mines keeping a reserve of gold or bullion with which to equalise yields. The subject was referred to at the meeting of the Sons of Gwalia by the Chairman, Mr. Cyril Wanklyn, when he said that the company did not earn its 4s. dividend during the past two years on the 31s. ore basis of the reserves. He added that the more the costs could be brought below 17s. the closer they would be to earning a dividend on the 31s. figure. Accretions of the bullion reserve on the basis of 31s., he added, would put into the hands of the company the surplus it required. So long as directors of a mine take shareholders into their confidence (comments the *Australasian*) there is not much harm in retaining a reserve of gold or bullion on the mine, but there is always the risk that the mine manager and the directors may not think it right, as do certain mine managers in Victoria, that the shareholders shall know that yields are being averaged. Officials may believe that the ore or wash is better than it is, and may consider that they are entitled to draw on the reserve should a poor yield come along, feeling confident that later on the return will recover up to the average. On the other hand, expectation in this respect is not always realised. Someone gets to know how things are going, and so, while yields are kept up, advantage is taken by those in the know to sell shares. The right course is for mines to declare the reserve they have in hand. Indeed, auditors do not perform their duties properly if every half year, when they have to go into the accounts, they fail to insist on revising the gold book, and seeing whether a store of gold is kept on the mine. If there is it ought to be shown, and if a manager is found not reporting the full quantity of gold or bullion his action ought to be a subject of review by the directors.

TOPICS OF THE WEEK.

THE MINES, COMMERCE, AND THE WAR.

The example set by the heart of the Empire in facing the commercial and industrial crisis caused by the war has not been lost upon this country. The Union Government, the mining industry, and the commercial bodies have united in a commendable and successful effort to solve the unprecedented problems of the time and to maintain business conditions on a normal basis. Evidence of this was forthcoming in abundance at the meetings of the various Chambers of Commerce and other commercial bodies held in the past week. Thus, at the annual meeting of the Witwatersrand Commercial Exchange, the Chairman announced that, following on the outbreak of war between Britain and Germany, the Committee met and drafted the following resolution to the Chamber of Mines: " The the Committee of the Witwatersrand Commercial Exchange transmits to the Chamber of Mines the assurance that the members of the Exchange are in agreement as to the necessity of everything possible being done to keep the mines running, and the Committee desires to assure the groups that there is no intention on the part of the merchants to unduly raise prices or take advantage of the present position. It is further desired to assure the groups that merchants are making every endeavour to secure stocks from all available sources, also that local manufacturers are doing everything possible to keep up their output of supplies." The Committee of the Exchange in conjunction with the Mining Section of the Chamber of Commerce twice met the Chamber of Mines. From these meetings a satisfactory arrangement was arrived at whereby the different buyers without destroying the separate identity of each buying office could compare notes on those stocks most urgently required for mining supplies during the war period. The result appears to have been most satisfactory. The Johannesburg Chamber of Commerce, which can always be relied upon to do the right thing in times of crisis, has been no less active. In the report of the Executive Committee, submitted to the monthly general meeting of members held yesterday, it is shown that the Committee has directed a considerable amount of attention to the several problems which have arisen out of the outbreak of hostilities. Endeavours were made by the Committee and by the Associated Chambers of Commerce to obviate any panic or apprehension in regard to the supply of foodstuffs by assuring the public of the adequacy of stocks of staple lines and by keeping prices at a reasonable level. The agreement of the principal retail grocers to the publication of a schedule of maximum prices has done much in this direction, and the position has been materially assisted by the action of the Government in carrying out the recommendation submitted for the insurance against war risk of wheat and flour imported from Australia. Moreover, in regard to mining supplies, it is stated that at a meeting of the mining material section held on the 7th inst., a resolution was unanimously adopted assuring the mining industry of cordial co-operation in all efforts to maintain the industry at its highest pitch, and that to this end the mining material merchants would do all in their power to keep prices on the most reasonable basis possible under existing circumstances. Particulars as to stocks in hand were supplied, and, as a result of conferences between sub-committees of the Chamber of Mines, the Chamber of Commerce and the Commercial Exchange, arrangements have been made respecting supplies which should provide for all the requirements of the mines. Apart from this question of mining supplies, other bright features of the situation are the satisfactory arrangements effected with the Bank of England in regard to gold, the re-opening of the Pretoria Mint, the fact that the Bank of England discount rate has gone down to almost normal, and that the rates of marine war insurance have remained most moderate. " Business as usual " is an excellent motto, if you are able to live up to it. In Great Britain most industries are concerned with things which people must have whether there is war or peace; but it is obvious that the demand for two or our leading products—diamonds and feathers—is stopped by any big war, and our loss and suffering on that account must be part of our contribution to the sacrifice. These things notwithstanding, the end of the first month of war sees South African commerce and industry displaying a reassuring power of resistance to the shocks of the unique conflict.

DIAMOND MINES' NEW ARRANGEMENTS

The fact that De Beers have succeeded in making financial arrangements to "carry on" is gratifying, both of itself and because it points to the possibility of the other diamond mining companies being able sooner or later to do likewise. Only a brief telegraphed summary of the new position at Kimberley has appeared in the Rand papers, and fuller details, taken from a speech by Mr. Francis Oats to the De Beers' employees, fully reported in the *Diamond Fields Advertiser*, may usefully be given. In the speech, as reported, Mr. Oats states clearly and concisely the circumstances which have compelled the temporary stoppage of production. In the first place, there was the serious pressure already operating prior to the outbreak of the war. The stock of diamonds was largely accumulating, and the state of the market was such that discussion had been proceeding for some months as to the wisdom of continuing to work the Kimberley mine. A provisional arrangement had been come to which, given normal conditions, would have enabled at all events the rest of the mines to be worked. Kimberley mine, however, it had been practically resolved to close. Then came the war, and the resultant financial collapse. The diamond market, which before had been in the indifferent condition described, was now closed. In proof of this, Mr. Oats points to the known state of things in regard to the open market on the River Diggings. This alone suffices to show that the situation is not one which has been in any way created by De Beers. The unparalleled financial crisis produced by the greatest conflict of civilised Powers in the world's history came at a period when the diamond industry, which under any circumstances would in the nature of things have been the first to feel its effects, was least calculated to bear the strain. De Beers Company and the Diamond Syndicate had between them over five million pounds worth of diamonds unsold. To go on producing under these circumstances, Mr. Oats points out, would have been folly. There was not only this large accumulation of stocks on hand, but the closing of the market for an indefinite period to be faced. Stoppage, of course, was distasteful to all concerned. The position which the company suddenly found themselves confronted, however, left no alternative. In the then state of financial affairs in Europe the London Board could get no money. They had securities, of course, but employees must be paid in cash. With securities of any kind unrealisable for the time being, and the demand for gold from all quarters such as there has been no precedent for in modern financial experience, cash was the very last thing that could be obtained. At length, after what Mr. Oats describes as a good deal of worrying and trouble, they have succeeded in obtaining credit from the Standard Bank, on securities to be lodged in London, sufficient to enable them to carry out such work—apart from the production of diamonds—as they now propose to take in hand. The facilities they have been enabled to secure will allow them to carry on for three months at least the programme of work announced. This programme, of which the salient details are published elsewhere, is designed to take the place of the original emergency proposal of rationing the employees, which was distasteful to all concerned from the first and was only adopted when there seemed no possibility of any other course. The change from rationing to the provision of a programme of work at half pay involves an additional expenditure of £13,000 to £14,000 per month. The company's action shows at all events that they have throughout been actuated simply and solely by the desire, directly their financial circumstances enabled them to do so, to make the best arrangements for their employees that could be devised, and that there have been no ulterior purposes to serve or motives at work. The scheme is purely a temporary one, to meet emergency conditions. It may be hoped that its duration will be limited to the period foreshadowed, but the ultimate developments must of course be governed by the course of the war. According to an official statement issued by the Minister of Mines on Thursday, the Premier Company has likewise decided that the men who were on their books prior to the January strike will continue to remain employees of the company, subject to alterations in wages and will be restarted at work when mining operations are resumed. In the meantime all employees, including those who joined the company's service after January last, will be allowed to remain in their houses free of rent and will not be charged for water or sanitary fees. It is also understood that the company intends voting a sum of money for a special relief fund, and as a consideration for the relief obtained from this source, employees who remain on the property will be called on to do such work as may be required. Steps are now being taken to prepare a scheme in connection with the removal of floating reef in the mine, which will provide work for those willing to accept it at wages to be decided by the Board. At the Koffyfontein Mine, the statement proceeds, work has been resumed on a reduced scale, and only white labour is being employed. A praiseworthy attempt is being made by this mine to keep their men employed by a mutual arrangement made with local storekeepers and merchants. It is understood that the Jagersfontein Mine has adopted the same scheme for rationing its employees as De Beers originally adopted. As regards the alluvial diggings every endeavour is being made to relieve the distress existing. The Assistant Inspector of White Labour has just returned from a tour in the Western Transvaal, after discussing the position with diggers, farmers and others, free railway passes are being issued to indigent diggers to enable them to return to their homes or to proceed to other places where they may be able to find employment. Arrangements have been made by the Provincial Administration for the issue of relief rations in necessitous cases. This form of relief is not considered satisfactory, and is only being adopted in extreme cases and till other arrangements can be made. It only remains to add that the greatest credit is due to the Minister of Mines and the Government for the satisfactory completion of these arrangements.

Crisis and the Mining Market.

Considering how great is the interest taken by the Continent in most of the leading mining shares, which are among the chief speculative favourites on our markets in normal times, it is not surprising that these were some of the chief sufferers by the war *débâcle*, writes a London correspondent. With foreign banks throwing out collateral wholesale, and Continental operators at their wits' end to raise money, jobbers naturally had to mark down prices to an abnormal extent, if only as a defensive measure. Quotations collapsed in a day, or even in an hour, as much as they have done in a whole account at periods of acute enough crisis, if not of the unprecedented character of the past week's semi-panic. By Thursday evening, prior to the decision to close the Stock Exchange *sine die*, quotations had become almost nominal, that is, did not represent a reliable basis for dealing purposes. A comparative table of prices of half-a-dozen representative mining shares shows that, except in odd cases, even the collapse during the period of the last Balkan War has been far exceeded. The speculators' extremity was the investors' opportunity, and in this case it was the small investors' opportunity. The big man could not buy large lines of shares in the open market at the quotations ruling, and his financial responsibilities would not as a rule have allowed him to do so, no matter how much he desired to avail himself of the bargains going. When a yield of 11 per cent. could be counted upon with reasonable certainty for such shares as Rand Mines and Modders nobody should have minded locking up in them a few hundred pounds that he could conveniently spare.

THE YEAR WITH THE ROOIBERG MINERALS.

Points from the Annual Reports—Mr. E. J. Way on the Position of the Mine—Ore Reserves—Percentage of Extraction—Prospects Reviewed.

The annual report of the Rooiberg Company for the year ended June 30 last has now been issued. The results of the year's operations at the mine were as follows:—Mill of 10 stamps ran 343·349 days; ore mined, 30,006 tons; ore from bins, 115 tons; ore taken from prospecting dumps, 2.296 tons; waste sorted out (10·02 per cent..), 3,236 tons; ore milled, 29,181 tons; sands and slimes re-treated, 11,462 tons; total treated, 40,643 tons. Concentrates produced, 1,294 long tons of an average grade of 68·51 per cent. metallic tin. It is estimated that there were on hand at 30th June, 18,848 tons of accumulated slimes, middlings, etc., of an average assay value of 2·5 per cent. metallic tin. The water storage reservoir and boreholes have provided an ample supply of water. The revenue from tin concentrates amounted to £152,889 4s. 0d.; the expenditure on working account was £97,083 15s. 2d.; the working profit for the year was thus £55,805 8s. 10d. A further £1,019 1s. 0d. was derived from interest, etc., making a gross profit of £56,824 9s. 10d., which, together with £17,063 13s. 2d., brought forward from last year, was dealt with as follows:—Interim dividends Nos. 6 and 7 of 10 per cent. and 7½ per cent. respectively, £31,500; appropriated for expenditure on fixed assets, £9,925; directors' remuneration, £2,340; Government taxes, £2,331; reserve fund, £5,000; carried forward, £22,787. An amount of £5,000 has been added to the reserve fund; including interest earned, the amount set aside for this fund now totals £15,350. In accordance with the policy agreed upon, all expenditure upon shaft sinking, development and exploration, amounting to £29,383 11s. 9d., has been charged direct to working costs. The average price for the year realised for sales of metallic tin was £174, as compared with an average of £218 for the previous year.

In his annual report, the Consulting Engineer, Mr. E. J. Way, writes:—The following are the principal matters of interest which I propose to deal with: (1) Results of operations, 1913-14; (2) ore reserve position; (3) percentage of extraction of metallic tin; (4) general position and prospects of the company. 1. Results of Operations, 1913-14. The following table shows the principal results of working of the past three years:—

	1911-12.	1912-13.	1913-14.
Tons milled	20,799	35,917	40,643
Revenue per ton	£5 1 7	£5 2 11	£3 15 3
Total working costs per ton	£3 10 1	£2 13 10	£2 7 9
Total working profit	£32,721 5 2	£88,193 11 10	£55,805 8 10
Grade of ore milled	4·94% M.T.	3·56% M.T.	3·181% M.T.
Percentage extracted	*57·97%	†72·85%	†78·81%
Average price at which metallic tin was sold	£197	£218	£174

In three years working costs have been reduced £1 2s. 4d. per ton, and extraction has improved 20·84 per cent. *Only current ore was treated. †Sands and slimes are included which had been treated previously in the old mill. In October, 1913, only current ore was treated, the extraction being 81·33 per cent. 2. Ore Reserve Position.—The position of the fully developed ore reserve is as follows: Blocked out ore reserve at June 30th, 1913, 22,000 tons, value 5·32 per cent. metallic tin; blocked out ore reserve at June 30th, 1914, 20,097 tons, value 4·95 per cent. metallic tin; decrease at 30th June, 1914, 1,903 tons, value 0·37 per cent. metallic tin. No attempt will be made on this occasion to estimate the probable ore based upon the results of the past five years, as it is extremely difficult to make the position clear without also giving a great deal of technical detail. Supplementary fillings not included in the real ore reserve yielded during the previous year nearly double the quantity obtained from lodes in excess of reserves. During the year under review this position has to a certain extent been reversed, and the quantity of ore mined from lodes in excess of reserves largely exceeds that obtained from supplementary fillings. There has been a decline in the size and number of pockets adjacent to the main lodes whilst the quantity of ore actually stoped from the lodes themselves greatly exceeds the tonnage calculated as actually blocked out for stoping. Sources of ore mined for period of five years and three months ended June 30th, 1914: Ex reserve, 21,453 tons=18·04 per cent.; ex supplementary fillings and lodes in excess of reserves and from development, 74,798 tons=62·92 per cent.; ex prospecting, 22,643 tons=19·04 per cent.; total, 118,894 tons=100·00 per cent. Thus, for every ton mined ex ore reserve, 5·54 tons were obtained from other mine sources as compared with 4·4 tons for the previous four years and three months. The actual tonnage of ore reserve which may with certainty be reckoned upon is as follows: Blocked out ore reserve, 20,097 tons, assaying 4·95 per cent. metallic tin; ore at grass, 4,292 tons, assaying 8·20 per cent. metallic tin; accumulated middlings and slimes, 18,848 tons, assaying 2·50 per cent. metallic tin; total, 43,237 tons, assaying 4·20 per cent. metallic tin. 3. Percentage of Extraction of Metallic Tin.—The extraction during the year, based on the assumption that the value of the final tailing, plus recovery, give a correct value of the battery pulp, was 78·81 per cent. metallic tin. This is an improvement of 5·96 per cent. as compared with the previous year, and justifies in every way the company's policy in enlarging and improving certain sections of the tin dressing plant. In my report last year I pointed out the difficulty which we had been experiencing in arriving at a uniform and correct method of assaying. I am now able to report that we have arrived at a method which gives us more satisfactory results. The technical advisers are using every effort to improve the extraction of the metal, and during the year under review great advantage, as shown by the improved extraction, has accrued from the addition of 42 rag frames, with subsidiary plant. Even now the tailings leaves the mill varying in value from ·6 per cent. to ·8 per cent., which shows that still some 20 per cent. of the contents of the material treated is not recovered. Research is still going on, and every new device which gives promise of success is carefully considered, and I have no doubt that, arising out of the present researches, further recommendations will be made in the future which will still further improve this position. It is impossible, however, to lose sight of the fact that for the treatment of slime at the company's mine the most successful apparatus in actual work to-day is the Cornish rag frame. Unfortunately, to meet this position, somewhat heavy capital expenditure would be necessary. In Cornwall these frames are worked out in the open. Climatic conditions make this impossible at Rooiberg, and it is absolutely necessary to house these appliances, adding much to the cost of installation. There are, however, certain machines specially designed for slime treatment which are being tried by our neighbours and ourselves, and I hope soon to be able to report something definite with regard to the possibility of further improvements in this department of our work. The drop in the price of tin makes it the more necessary to use every endeavour to improve our extraction methods, as the obtaining of even a small proportion of the tin now being lost can be looked upon as being practically all profit. 4. General Position and Prospects of the Company.—Last year I pointed out that the plant would probably yield a higher extraction, and this, I am glad to say, has been accomplished. I also stated that I thought the working results which would be obtained for the year now under review would show an improvement over past results, pointing out that the actual profits earned would depend upon the price of the metal. It is satisfactory to note that through careful management the costs have been reduced by 6s. 1d. per ton milled as compared with the previous year. Prospecting and exploration work have given exceedingly satisfactory results, and small bodies of high grade ore are continually being disclosed during these operations. It may be stated that development in depth has not been up to expectations, but, in my opinion, just as we find, laterally, comparatively long stretches of unprofitable mineral, we are justified in expecting to find similar conditions in depth. The lowest point in depth is only 410 feet vertical, whereas lateral exploration has extended for 6,000 to 7,000 feet, and it would be unfair, until a great deal more work has been done, to arrive at the conclusion that the ore bodies in depth will be non-profitable. The venture is in a sound position, and will continue to be profitable even should the price of the metal reach a much lower limit than that which has been experienced since operations were commenced.

The report of the quarter ended 30th June, 1914, is as follows:—Revenue and Expenditure.—Estimated profit for the quarter, £8,284 12s. 9d.; profit declared, £7,735 9s. 1d. Note.—(1) No allowance has been made in the above statement for Government Profits Tax; (2) The average price per ton of metallic tin on which the quarter's revenue has been determined is £148 2s. Reduction Statistics.—Number of stamps running, 10; number of days run, 84.980. Tons treated: Quarter ending 31st March: From mine, 7.188 short tons; sands and slimes re-treated, 3,129 short tons; totals, 10,317 short tons. Quarter ending 30th June: From mine, 6,318 short tons; sands and slimes re-treated, 3,223 short tons; total, 9,541 short tons. Concentrated produced, 305 long tons. Middlings and Slimes.—Accumulated tonnage not yet re-treated, 18,848 short tons; estimated average assay value, 2.5 M.T. Capital Expenditure.—The capital expenditure for the quarter was £1,990 14s. 1d. Exploration.—Exploration on the surface has been continued during the quarter, with satisfactory results. General.—In view of the heavy fall in the price of tin, development in the lower levels of the mine has been considerably curtailed, and portion of the savings have been diverted to further surface exploration. Dividend.—A dividend of 7½ per cent. (equal to one shilling per share) is respect of the operations for the half-year ended 30th June, 1914, was declared payable to all shareholders registered in the Company's books at 30th June, 1914.

Robinson

The quarterly report of the directors of the Robinson Gold Mining Company, Ltd., for the period ended the 30th of June shows the revenue from gold won to have been £258,786, the value being £1 13s. per ton milled; while the total working expenditure (£112,062) represented 13s. 9d. per ton milled.

THE GEOLOGY OF GERMAN SOUTH-WEST AFRICA.

Comparison of the Sequence of the Strata with Rest of South Africa.

The following discussion on Mr. F. E. Studt's paper, entitled "The Geology of Katanga and Northern Rhodesia: An Outline of the Geology of South Central Africa," was read by the Secretary at a recent meeting of the Geological Society of South Africa on behalf of Dr. Paul Range:

In the discussion of Studt's important paper, "The Geology of Katanga and Northern Rhodesia," I may add a few notes concerning the geology of German South-West Africa. Studt believes that Passarge's[1] Maseganite formation and Wagner's[2] [illegible] Series represent the Swaziland System in Damaraland. I should rather like to correlate them with the Ventersdorp System, while Wagner is of opinion that some of the conglomerates may represent the Banket of the Witwatersrand. From other parts of the country I have never seen conglomerates resembling those of the Witwatersrand, and I believe also that Kuntz would have observed them if they existed in the Kaokofeld, the north-western part of the German Colony, about which he and Krause lately gave valuable geological information.[3] [4] Voit[5] in 1904 divided the crystalline coastal belt of Damaraland into three horizons as follows: (1) A granite gneiss zone, (2) a gneiss-schist zone; (3) a schist zone. Corresponding with his observations, I divided the "Primary" formation of Great Namaqualand also into these three horizons.[6] I may state that they are only of value till we have more detailed observations and are able to classify that formation better. The upper division of the Transvaal System exists also in German Namaqualand, and is represented by the Schwarzrand series, which consists of conglomerates, grits, gray and green sandstones and black shales[7]; they are well developed in the district of Maltahöhe. Further south in Little Namaqualand, where I stayed in April, 1913, and had a look over the country under the guidance of Dr. Rogers, the Steinkopf beds[8] correspond with the "Kubub series" in Great Namaqualand. Their correlation with the formations further south is given by Rogers in his paper, "The Nama System."[9] To correct my geological map of 1912, I may add that the Karoo formation extends to the Orange River at Velloors Drift and Aussenkehr. As mentioned before, Kuntz investigated the Kaokofeld in 1910 and 1911 and noticed large sheets of amygdaloidal diabase and similar volcanic rocks underlain by soft gray and yellow sandstones; the complex is named Kaoko formation according to Gurich.[10] Although Kuntz did not observe typical Dwyka conglomerate, he believes that the sandstones belong to the Karoo formation, and that seems very probable. As far as I know, the glacial conglomerate thins out near Kub in Great Namaqualand [illegible]. South of that place I observed it only a few feet thick; there it is overlain by a large sheet of amygdaloidal melaphyre, stretching to the east into the Kalahari. Rimann[11] observed the higher horizons of the Karoo formation in the Gobabis District on the Nossob and near Aminuis represented by a sheet of [illegible] underlain by black shales. According to the observations of Rimann the northern border of the Nama formation is given by the Nossob [illegible] east of Windhuk. I believe that great parts of the "Sandfeld" north-east of Windhuk are also underlain by Nama formation. In Hereroland only some elevated mountains are formed by this formation. Cloos[12] observed in the Erongo north of Karibib quartzites probably corresponding with the Kaoko quartzites, overlain by amygdaloidal melaphyre and acid volcanic rocks such as porphyry, porphyrite and tuff. That author also observed a younger granite on the southern side of the Erongo besides the well-developed older granite, the latter with pegmatite veins containing tourmaline, discovered in 1910 and now worked with more or less success. Further north the Nama formation covers the Otavi mountains, the Waterberg plateau and a great part of the Kaokofeld, chiefly developed as Otavi-dolomite and Kubib quartzite. The fossils of the Otavi-dolomite are pseudo-fossils, as Gurich[13] states, so that we have no palaeontological evidence for the age of the Nama formation. I believe that great parts of the Ovamboland and the north-eastern Sandfeld are also underlain by horizons of the Nama formation and perhaps of the Karoo formation, and that the sand of this immense tract of country takes its origin from the weathered horizons of these formations. Wagner mentions outcrops of Botletle series on the Okavango. [illegible] rocks occur on the south of the Okavango near Andara and on the Zambesi at Katima Molilo and Kasanguli, but it is not yet quite clear to what formation they belong. The younger formation in the coastal belt of Luderitzland is not of cretaceous age. The determinations of Merensky[14] are not confirmed by newer investigations, which give clear evidence that the sandstones, clays and conglomerates of Bogenfels belong to the middle Tertiary; quite the same results were obtained by Schwarz[15] concerning his Alexandra formation. If I add that in 1911 I discovered a series of porphyries, porphyrites, tuffs and conglomerates underlying the Nama formation and overlying the Primary formation with breaks, in the districts of Maltahöche and Bethany in Namaqualand, stretching from latitude 24° to 26° in a long strip on the 16° of longitude, which I named Konkip formation, and correlated with the Ventersdorp system of the Transvaal, the sequence of the strata in German South-West Africa compared with other parts of South Africa may now be shown as follows:—

German South West Africa.	*British South Africa.*
Kalahari Surface Deposits Botletle Beds	Kalahari System.
Middle Tertiary of Lüderitzland	Alexandra Formation.
Karoo Formation	Karoo Formation.
Nama Formation	Waterberg System. Transvaal System.
Konkip Formation	Ventersdorp System.
Primary Formation	Primary Formation.

In conclusion, I may add a few notes on the stratigraphy of German East Africa and Togo in connection with Stud's paper. Newer investigations in German East Africa by Tornau[16] show that the Tanganyika formation is extensively developed in the south-western parts of that Colony, and so far as I can see the Tanganyika formation is the same as the Lualaba beds of Studt and also the Karoo formation. Fifteen years ago coal seams were discovered on the eastern shore of the Nyassa lake by Bornhardt.[17] In Togo, Koerts[18] mentions a glacial conglomerate in the Buem formation, and he believes that this conglomerate is also of Karoo age. I think that through the work of Mr. Studt we have made a good step in advance concerning the correlation of the strata of the whole of South and Central Africa, and that some years later we may be able to give a general classification of all the different systems of the Continent.

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[1] Passarge. "Die Kalahari," 1904. I cannot make out the term Maseganite formation in this work. [2] Wagner. "The Geology of a portion of the Grootfontein District of German South-West Africa." *Trans. Geol. Soc. S.A.*, 1910. [3] Kuntz. "Die Geologischen Verhältnisse des Kaokofeldes." *Monatsber. der deutsch. Geol. Ges.*, 1912. [4] Kuntz and Krause. *In Zeitschr. fur. Prak. Geol.*, 1913, mit geol. Uebersichtskarte. [5] Voit and Stollreither. "Beitrag zur Geologie des Kupfererzgebiets in Deutsch Sudwest Afrika." *Jahrb. der Kgl. Preuss. Landesanstaldt*, 1904. [6] and [7] Range. "Geologie des Deutschen Namalandes." *Beitrage zur Geol. Erforschung des deut. Schutzgebiete II.* Berlin, 1912. (Gives a list of the earlier publications. [8] Leipoldt. "The Steinkopf Beds." *Trans. Geol. Soc. S.A.*, 1911. [9] Rogers. "The Nama System in the Cape Province." *Ibid*, 1912. [10] Gurich. "Deutsch Sudwest Afrika." *Mitt. des Geogr. Ges. zu Hamburg*, 1891-1892. [11] Rimann. "Geologische Karte des Khamas Hottentottenlander," Berlin, Dietrich Rimer, 1913. [12] Cloos. "Geologie des Erongo in Hererolande." *Beitr. zur geol. Erforschung des deutschen Schutzgebiete, III.*, Berlin, 1911. [13] Gurich. "Vermeintliche Fossilien des Otavikalkes in Deutsch Sudwest Afrika." *Monatsber. des deutschen Geol. Ges.*, 1913, No. 2. [14] Merensky. "The Diamond Deposits of Luderitzland." *Trans. Geol. Soc. S.A.*, 1909. [15] Schwarz. *Ibid*, 1913. [16] Tornau. "Zur Geologie der mittleren und westlichen Teile von Deutsch Ost Afrika. *Beitr. zur. geol. Erforschung des Deutschen Schutzgebiete VI.*, *Berlin*, 1913. [17] Bornhardt. "Zur Geologie und Oberflachengestalt von Deutsch Ost Afrika," Berlin, 1900. [18] Koerts. Begleitwort zur geologischen Karte von Togo in H. Meyer, *Das deutsche Kolonialreich II.*, Leipzig, 1910.

Betsiriry Proprietary Oil Fields.

At the statutory meeting of the shareholders of this company, the Chairman (Mr. A. Macdonald) announced that the capital called for was practically fully subscribed. Instalments had been paid in a most satisfactory manner. Owing to the European crisis subscribers who had been [illegible] or called out in the defence of the country would be granted an extension of time in which to pay their instalments. Dr. J. McDonald Henderson, who has been engaged in superintending the company's boring operations in Madagascar, will leave Australia with the drillers at the end of this month. The company having acquired a fully equipped plant, consisting of two drills, will, on their arrival in Madagascar, be in a position to start drilling operations at once. In the meantime Mr. J. H. Taylor is looking after the company's interests on the island. The Chairman stated that a communication in reply to an enquiry from the board has been received from Mr. Cunningham Craig commenting favourably on the company's prospects.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

War Relief Funds and Scientific Societies.

To the Editor, *South African Mining Journal.*

Sir,—The eloquent appeals for voluntary contributions to relief funds should be responded to specially by all the professional, technical and friendly institutions which have funds in South Africa. I have requested the President and Council of the South African Institution of Engineers to contribute from the fund of over £1,000 which has been accumulated by the Institution. I suggest to the members of that Institution, they should at once write praying the President and Council to contribute regularly during the war towards the following, viz.: (1) The Governor-General's Fund (Lord De Villiers); (2) The Belgian Widows and Orphans Fund (Treasurer, J. L. van Lier, Box 89, Johannesburg); (3) Femmes Françaises du Transvaal (Treasurer, Mademoiselle Renaud, Sevington, St. George's Road, Parktown, Johannesburg). My object in writing you and asking you to publish the above is to give publicity at this awful period to the fact that certain funds are available and should be used for these most laudable objects. Further, that if the engineering, chemical, metallurgical, mining, architectural, and other professional institutions and societies desires run in the direction as outlined above, the members should write at once to their Councils and request them to act.—Yours, etc.,

KENNETH AUSTIN,
Member, S.A. Institution of Engineers.

"The Exudation of Nitro-Glycerine."

To the Editor, *South African Mining Journal.*

Sir,—As an "old timer" who has had the experience of picking up pieces of human beings—black and white—after blasting accidents, the work of the "Safety First" Committee in preventing or reducing such accidents appeals to me very strongly, and the question of "watery" gelatine has ofttimes given me more than a passing thought. In the past the carelessness or incompetence of the miner was given as the sole cause of premature or other explosions which ended in loss of life or limb. It is with great pleasure, therefore, that I find Mr. W. Cullen refuting this idea and placing the blame where it rightly belongs, viz., on the shoulders of the explosive manufacturers (*vide South African Mining Journal*, August 15th). He states that "the cause of many mysterious accidents during the charging up of holes" is due to the exudation of nitro-glycerine, and "exudation is the result of the use of bad quality collodion cotton"; to the nature of the wrapper; to our means of transport, and in a lesser degree to our method of storage. The miner cannot be held responsible for the quality of the collodion cotton, or the wrapper, and he is not asked his opinion as to whether or not the vehicles used for transport are those which give the minimum number of vibrations per second, nor is he asked his opinion as to the influence the *shape* of the case has on the manner of storage. The miner is not taught how to use *free nitro-glycerine*, and when he receives this, plus blasting gelatine, he treats it as he would the latter with the result that there is a chance of a job for the "First-Aider." We are led to believe that if sufficient nitro-cellulose is used to thoroughly absorb the nitro-glycerine that the resultant mixture becomes insensitive. This may be so, but, providing the compound is subject to the detonating influence of a No. 8 cap one would think that the less sensitive it is the better. It would be interesting to know, Mr. Editor, how much "explosive" would be destroyed or find its way back to the factories if the miner was taught to recognise "exuding cartridges" and the danger attending their substitution for—well, let me say, *bona fide* blasting gelatine. In most branches of commerce, merchants and manufacturers are set a standard for their goods and any deviation therefrom brings with it certain penalties. If this was done in the explosives traffic we would hear less of the "triple combination of pressure, grit and *nitro-glycerine*, which is truly a most favourable one for causing an explosion."—Yours, etc.,

W. LACEY.

West Rand.

Economics of Citrus Growing.

AN INDUSTRY FOR PHTHISIS VICTIMS.

To the Editor, *South African Mining Journal.*

Sir,—I have read with a good deal of interest the discussion on the above subject. "Economist" is certainly over optimistic. It is always easy to prove anything on paper. In the original article I notice you state that ground of a similar character to that of the Low Veld would readily fetch £150 per acre in California, Florida, or British Columbia, yet in your excerpt from the S.A.N.U. report orchards, after reaching the bearing stage, only realised at £80 to £250 per acre. Now if that is the case, one would hardly say it was a commercial proposition to pay £150 per acre for unimproved land, and after clearing, ploughing, planting out, and tending for anything up to seven years, to only realise the lower figure of £80, or even the higher one of £250, which means that, say, seven years' labour has been expended for £100, or under £14 6s. per acre per annum. Why, any decent crop of teff grass would give a higher return per acre than that. Land must have increased enormously in value in Florida since my residence there for it to command anything like the price you mention—$150 would be nearer the mark. Please do not think I wish in any way to detract from the possibilities of citrus growing in this country. I only wish to point out the fallacies which might lead some to invest their little all in such a venture on the strength of these articles and letters, or, maybe, throw up a good billet to go in for it. Now, sir, I would like to point out to start that 20ft. apart is too close; 24ft. or 25ft. is quite near enough, and this will reduce your number of trees to the acre very considerably. I regret I have not Mr. Davis's report, but I do not think he stated it is common, after five years, for farmers to obtain a return of 35s. per tree from oranges and 60s. from naartjes. I happened to be at a meeting at which Mr. Davis made this statement concerning *one* farmer in this district, and stated that they were the finest trees he had ever seen for their age. Mr. J. B. Bright does not state that he obtains £4 from every lemon tree, only that he had made as much as that.

I note you also state that there is no need to worry about local markets, nor is there for W. Navels and perhaps two other varieties of Oranges, but Lemons are grown entirely for the local market. We can never hope to compete against the European grown Lemons, and whilst trees return a fair profit equal to Oranges, and sometimes better, there is only the demand which is bounded by our local markets. I do not think Mr. Bright gave the age of the lemon tree as five or six years from which he had received £4; these trees were planted before Mr. Bright took that farm, which, if my memory serves me correctly, is about six years ago. Now, sir, your and "Economist's" suggestion that retiring miners could take up land and go in for citrus culture. Your suggestion that a retiring miner or commercial man might purchase ten acres, etc.—where can he find the owner willing to sell him ten acres at £4 per acre with water, or, as it is expressed, under irrigation furrow? The possibilities for a combination of ten are certainly greater, but owners would be pretty foolish to sell their irrigable land at such a price when probably the great proportion of the remainder of the farm is worth only 10s. per acre without that piece. I will deal with this again later on. I note you also state budding can be carried out *probably* more successfully by women than men, and requires only a little commonsense to learn. As regards women as budders, I fear, sir, they would have to wear the garments of the male sex, although I am aware they have reduced the amount of material used in their skirts almost to vanishing point. I think they would find this was one of the professions best left to the mere man. Imagine the state of their hands and arms after the scratching they would receive from the thorns of the lemon stocks on which all oranges as well as lemons are now budded, or the shrieks if on stooping they sat down suddenly on a particularly pointed specimen. Believe me, sir, this is a long way from being either easy or pleasant, and whilst it *may* only need commonsense it is the one who learns young who is most likely to become the expert budder of citrus trees. In the S.A.N.U. report it states Mr. Davis recently *instanced cases* in which 35s. has been made *annually* from orange trees and 60s. from naartje trees *five years old.* Now the same trees can only do that one year, for the obvious reason that the next year they would be six. It strikes me this should read from five years old and upwards.

Now to go on to "Economist's" letter proper. He suggests that it would be an excellent investment for a number of phthisis afflicted miners to form a mutual co-operative society, and under the guidance of Mr. Davis acquire a suitable farm possessing depth of soil and sufficient water to put a hundred acres under citrus. Now, Mr. Davis is one of the most accommodating of men, and would stretch a point to give a leg-up to anyone desiring it, but he is not a real estate agent, and although he would, I am sure, be quite ready to report on the suitability of the site for citrus, he might not be ready, even if his other duties permitted it, to visit, say, half-a-dozen different farms in as many different wards of the Low Veld. Apparently, although "Economist" states they might acquire a farm with water, etc., sufficient for 100 acres, in his subsequent figures he omits to enter the cost of the farm or the size they might have to purchase to get that 100 acres under irrigation. Many of the farms here are from 1,000 to 5,000 morgen, a good deal of it mountain—good grazing, [illegible] land. Now, [illegible] company might purchase a farm like this, [illegible] on a 2,000 morgen farm, and at [illegible] it would be an initial outlay of [illegible]. I would much rather buy my land by the [illegible] "Economist" than by the acre, as he makes it cost double as much per acre as it does per morgen, for he says the cost of the ground at, say, £4 per morgen or £8 per acre would be £800. Now, I would have expected to have paid only £200 at £4 per morgen or £400 at £4 per acre. Then he says to plough and *plant* the plot of 100 acres would cost 15s. per acre. Does he mean one ploughing only—no discing or harrowing or levelling down in any way? And what is to be planted? He cannot mean the trees as they are allowed for in the next item. What about clearing off bush—a very necessary preliminary in the Low Veld—and costing as much as 25s. per acre alone? The ploughing and harrowing will cost quite the 15s. per acre. If the cattle have to be purchased and implements, it will work out at more than that.

The cost of digging holes and planting so [illegible] of the soil is [illegible] all [illegible]. I have known Kaffirs to dig sixty holes a day, and I have known them to [illegible] depends on the soil and the Kaffirs. To plant, stake and water each tree will cost [illegible] out of the land and digging the holes. The [illegible] 10,000 trees. [illegible] through which it has to be brought. Trees of first quality [illegible] to be purchased to-day at 2s. 6d. each unless you are fortunate enough to find someone who has over-estimated the amount they can supply with water, or some similar reason, and have to offer their surplus trees. This, I understand, has occurred in "Economist's" district, and he is not therefore to blame for that error. Good Washington Navels, first size trees, are worth to-day £150 per thousand, and the demand is far in excess of the supply. "Economist" presumes the phthisis afflicted miners would not be prepared to take possession until the proposition had reached the producing stage. I do not profess to much knowledge of this scourge, but I was under the impression that it was more or less essential that those afflicted with it should be as much in the open air as possible. Does "Economist" intend in his scheme that they should continue to work at their calling for those six years? If so, I should imagine, with my slight knowledge of this complaint, that there was a very fair chance that they would not live to see the producing stage reached, or if they did, would be in such a poor state of health that they would be quite unable to put any energy into the venture. I see "Economist" states that a manager with the *necessary experience* could be obtained for £20 a month. Can they? In ten years or so they might, but not now, and let me say right here that if your miners want to make a success of it, they should learn the business of growing the trees, and not take it over at the producing stage. There is a lot more to be learnt in this way, and the handling and attention to small trees will put them into a much better position so far as knowledge of the requirements and treatment of the trees goes than any amount of theory placed before them in papers, etc.

Now I want you, sir, and your readers to disabuse their minds of any ideas they may have formed that an orchard brought to the producing stage can be run at a profit without any previous knowledge. That is a rock which even a miner might find pretty hard to remove. Mr. Hall is perfectly right in saying you cannot take a man and put him in an orchard and make an orchardist of him. It is not the actual growth of the trees, but the ability to grasp that a tree, say, is not thriving. It is easy to say "Why, any fool could see that sort of thing." Perhaps so, after the insect or disease had made such inroads into the tree that it was palpable to a novice. Where your trained man, or the man who had watched each tree from the start, would discover the cause at its early stages, and used the necessary remedies for it, your man just dropped into the orchard would have to sit down and write to the Agricultural Department for advice as to the treatment, and get his reply as soon as it was possible. But the horticultural expert is travelling from one end of the Union to the other, and it would possibly be some time before he received his reply. In the meantime he would probably have tried some remedy or other which he might think applied to the particular disease or insect pest which was causing the trouble—possibly doing no harm to the trees and possibly no good. In the meantime the disease might obtain such a hold on the tree and those around it that its crop would be valueless. Now the potentialities of citrus growing in this Low Veld are enormous, but I want you and your readers to realise that although the returns will for years to come be also enormous on properly worked and attended to orchards, on neglected ones or those badly looked after the returns will be poor and the profits less. There are men in every walk of life who would make a success of citrus or any other fruit growing under proper conditions, simply because whatever they take in hand they throw their whole energy into it. On the other hand, there are men—and these, I fear, are in the majority—who, given ideal conditions of soil, water and climate, they would never make it a real success. It might pay a small profit, but not 35s. per tree, which, by the way, I believe is returns not profits. Now let me say right here that I am sure Mr. Bright would be the last man in the country to pose as an expert on citrus culture. An expert is not made, as some appear to think, after a couple of years at an agricultural college, nor with [illegible] of college and practice combined. Mr. Hall has certainly a much larger experience of citrus than Mr. Bright has. Mr. Hall's statement of clearing 10s. per tree per annum is a good deal nearer the average net profits, although in many cases individuals may have cleared as

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high as 35s. per tree, or even higher from single trees, but I take it that we want the average annual profits, not the annual returns.

That land will increase in value very greatly in this district I am quite convinced, and every farmer with water available knows it. If you want openings for the afflicted miners let your big mining companies and your land companies develop some of their land with citrus groves, and place some of the miners under a manager who has at any rate some knowledge of fruit, even although his main knowledge may be other branches of agriculture. Many of the companies have farms which could be developed into splendid paying propositions. Let them develop their farms on these lines, even if their manager may be more in the way of a travelling manager. There would be plenty of work for quite a large number of miners in assisting in development—furrows, etc. Let these grow in knowledge with the trees, then at the producing stage let the companies give each man charge of a thousand or two thousand trees, with a percentage of the profits, or cut it up in blocks and sell to them on repayment. Your mining companies would still retain the mineral rights, so that the shareholders would be quite covered as far as the particular farm or farms were concerned. The country would be benefited in that a large export asset would be added to its other assets. Your men who meant to make a success would do it, whilst the other sort would just naturally drop out of the running and seek other forms of exertion. By this scheme you would not have banded together, say, ten men, five of whom might be the right sort and the rest not. The result of such a combination would be disastrous to the right men, and would probably end in the whole ten of them chucking the thing up. Now, sir, in conclusion, let me say that the 10s. per annum net profit has been queried by one of the farmers' delegates from Natal, on the grounds that this did not work out in practice to every tree. I put 10s. in this figures given to Mr. Hyde, so that there should be no question of optimistic reports, etc. I hold that, given right soil, climate, and water, 10s. per tree after six years old is a very low estimate, and that with proper care and attention this *net* return may be easily doubled, but the whole thing lies in the *proper care and attention*, and one white man with six Kaffirs cannot look after 10,000 trees, even in their young stage.—I am, etc.,

A. E. BESTER.

Citrus Siding, *via* Nelspruit.

Companies to be Struck Off.

In accordance with Section 196 (3) of the Companies Act, 1909 (No. 31 of 1909), at the expiration of three months from the date hereof the names of the undermentioned companies will, unless cause is shown to the contrary, be struck off the register, and the companies will be dissolved in terms of sub-section (5) of the aforementioned section:—

No.	Name of Company.	Date of Registration.
304	Agnes Munro Main Reef Gold Mining Co., Ltd.	25/4/1889
393	Cinderella Gold Mining Co., Ltd.	8/8/1883
703	New Blue Sky Gold Mining Co., Ltd.	22/10/1892
705	New Comet Gold Mining Co., Ltd.	2/11/1892
977	Angelo Gold Mines, Ltd.	30/4/1895
1004	Driefontein Consolidated Mines, Ltd.	21/5/1895
1520	H. F. Co., Ltd.	9/4/1898
1684	Cason Gold Mines, Ltd.	26/3/1902
1949	The Transvaal General Lands Syndicate, Ltd.	15/6/1903
2129	Standard Dental Institute, Ltd.	18/7/1904
2227	May Diamonds, Ltd.	30/12/1904
2596	Iris Diamond Prospecting Syndicate, Ltd.	28/9/1906
2641	Elmas Diamonds, Ltd.	4/12/1906
2800	The Bowerfield Estate Co., Ltd.	21/6/1907
2890	The Scrap Metal Exporters, Ltd.	17/12/1907
2892	African Diamond Corporation, Ltd.	18/12/1907
3015	Koller Syndicate, Ltd.	23/9/1908
3052	The Progressive Monthly, Ltd.	3/12/1908
3056	Gevonden Mining Syndicate, Ltd.	12/12/1908
3058	The Oshoek Tin Syndicate, Ltd.	15/12/1908
3121	Clover Union Options, Ltd.	3/4/1909
3174	The Union Smelting Co. of South Africa, Ltd.	29/6/1909
3236	Wimbledon Diamond Developments, Ltd.	19/10/1909
3487	The Farmers' Fresh Meat Supply Co., Ltd.	16/6/1910
3519	United Dairies, Ltd.	11/7/1910
3552	Hoekplaats Gold Mining Syndicate, Ltd.	12/8/1910
3629	The Asia Mines, Ltd.	29/11/1310
3677	The Consolidated Building & Investment Co., Ltd.	10/2/1911
3694	The Victoria Diamond Syndicate, Ltd.	17/3/1911
3756	The Household Butcheries, Ltd.	26/5/1911
3917	The Barker Contracting Co., Ltd.	24/1/1912
4035	Rand Torch Factory, Ltd.	16/7/1912
4160	George Baird & Co., Ltd.	5/3/1913
4203	Bremner & Blumberg, Ltd.	23/4/1913
4229	Covent Garden, Ltd.	28/5/1913
4282	The Riversdale Gold Mining Syndicate, Ltd.	26/8/1913
4315	Local Automobiles, Ltd.	29/10/1913

Ferreira Deep.

The report of the directors of the Ferreira Deep, Ltd., for the quarter ended the 30th of June states that as a result of the improvement in the native labour position the tonnage milled in that time shows an increase of 19,810 tons, with a consequent reduction in costs per ton, but on account of the exhaustion of the Ferreira (Outcrop), it was necessary to replace this tonnage from the Main Reef exposed in the Lead stopes at the west end of the Deep mine, and the low grade South Reef lying to the east of No. 1 shaft, with the result that the grade recovered has been lowered, the profit showing a reduction of £7,370. Thew total working expenditure was £151,233, or 17s. 1d. per ton milled, and the value per ton milled worked out at £1 16s. 4d., the gold account being £321,280.

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Rhodesian Section.

LATEST MINING NEWS.

Eldorado—Shamva—Eileen Alannah New Plant.—A Batch of Annual Reports.

Despite the difficulties encountered at the mine, Eldorado costs have been reduced to 22s. per ton, and ore reserves have been increased to 55,900 tons reserves of an average value of 15 dwts. The mine has not, however, quite got over its bad days, and though there is a slight improvement on the parallel reef at the 15th level, this section is still unpayable, and in order to keep the mill going it will be necessary to develop four levels annually, a task which will tax the developers to the utmost limit. The new vertical shaft has been sunk to the 15th level, and has been a costly business, owing to bad ground encountered, the lowest section costing no less than £22 6s. per foot. Fortunately the directors, during years of prosperity, have accumulated a substantial reserve, which should now see the mine through to brighter days.

* * * *

Official confirmation of the increased values at depth obtained at the Queens mine is now forthcoming. Seventy feet below the 8th level values are given at 17 dwts. over 60 inches, while the 9th level drifts have been showing 24s. to 12s. 6d. over 36 inches. These results are highly satisfactory, and in view of the fact that the main shaft is considerably below these points, the management is in a position to quickly develop a large tonnage of pay stuff and so pave the way for the larger plant which has long been contemplated.

* * * *

A large proportion of the new plant for the Eileen Alannah is now on its way to the mine, and the entire installation is expected to be running at the end of February next. The plant is of 5,000 tons monthly capacity and will cost some £30,000 when installed.

* * * *

A five-stamp mill has been erected upon the Mayfair Claims, Filabusi district, now owned by Messrs. Arberry and Hicks, and the prospects appear thoroughly good. The reef was partially developed by one of our big companies, and from their work the new owners are now stoping and obtaining high values. On the other end of the property the reef is reported to be ten feet wide, and milling about 15 dwts. The mine is well supplied with wood and water.

* * * *

The manager of the Selukwe Columbia reports 28,000 tons developed of an average value of 11 to 12 dwts. and an estimated profit on this tonnage amounting to £15,000. The tributors of the Yankee Doodle still continue to do remarkably well and I understand that the results on alleged refractory ore by Mr. Francis, who is in charge of the cyanide works, are really remarkable, and greatly exceed those recorded by the company. If this is correct it may be that the old sand dump may still yield a profit from re-treatment.

* * * *

The Shamva mine is now fairly in its stride, and last month the output exceeded £38,000 from 50,000 tons crushed, the mill duty at length coming up to engineers' estimates. The costs are still being maintained at the original low level, 7/10, which an office note states includes all mine and office expenditure. The bulk, therefore, of the £18,000 estimated profit will be available for dividends, so that the mine should yield on present profits a sum approaching 40 per cent. on issued capital.

Rhodesia Consolidated.

The Directors' report to March 31st shows a profit for the year of £[illegible], as against a loss of £18,[illegible] for the eighteen months covered by the previous accounts. The number of undeveloped claims owned by the company has been reduced from 765 to 715, and partly owned claims from 40 to 26. No development was prosecuted during the year, "in view of the difficulty of raising capital for mining propositions," but [illegible] acres of land were sold at an average price of 9s. 9d. per acre, the profits on these sales amounting to £1,917. These sales compare with those of recent years as follows:—

Year	Acres Sold.	Average Price per Acre.	Total Profit.	Average Profit per Acre.
		s. d.	£	s. d.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	1,917	[illegible]

The company holds [illegible] shares in the [illegible] Mine, whose [illegible] shares in the Ayr Mines, and [illegible] shares in the [illegible] Trust, while in respect of its controlling interest in the [illegible] [illegible] [illegible] Conditions have continued against raising [illegible] for the Ayr to bring it to production stage.

New Rhodesia District Development.

The Directors' report states that for 1913 the shareholdings are brought into the accounts at £75,651. The estimated value at December 31, 1913, was £46,498. The balance standing to debit of expenditure account in London and Rhodesia amounts to £82,519. The report gives the following information, which has been supplied by the companies in which the company holds substantial share interests:—Battlefields (Rhodesia), Ltd.—The tributing lease of the Battlefields mine terminated on December 31, 1913, owing to there being little or no prospect of any further pay ore being opened out in either the Invincible or Trafalgar mines. Every effort having been made, but without success, to re-let the mines on tribute, it was decided to abandon all claims except the Invincible. Bwana M'Kubwa Copper Mining Co.—The treatment of the high-grade ore is being continued, and the board understands that the directors of the Bwana M'Kubwa Co. are negotiating for erection of a plant to treat the low grade ores. Information is also given as to the position of the Kimberley (Mashonaland) Gold Mining Co. and the Rhodesia Copper and General Exploration and Finance Co.

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SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - Practically ALL ,,
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S.W. TRANSVAAL DIAMOND FIELDS: JULY OUTPUT.

Substantial Increase on June Total.

From 41 areas in the South-Western Transvaal the diamond output in July showed a total of 4,695⅞ carats, valued at £19,234 3s. 6d. In June a total of 3,549⅝ carats, valued at £15,984 17s. 6d., was returned, so that last month's output shows an increase of well over £3,000 upon the previous month's, and is, in fact, the largest recorded this year. A summary of the returns, with a few details, is given below:—

	Carats.	*Value.*
Bloemhof	1,240	£4,750 15 0
London	645¾	2,547 12 6
Kameelkuil	537¾	2,532 10 0
Kareepan 164	322½	1,233 12 0
Eastleigh	277¾	1,058 6 0
Modderkraal	161¾	1,026 0 0
Panfontein	242½	913 13 0
Cawood's Hope	197¼	793 17 6
Christiana	160¾	789 12 6
Dievedraai	146¼	599 0 0
Rietput	85¾	439 7 6
Diamantdoorns	79¼	359 10 0
Koppiesvlei	49¾	211 0 0
Schweizer-Reneke	46⅞	204 0 0
Kareepan 137	50½	179 5 0
Kromellenboog	58¾	174 7 6
Avondster	55¼	160 17 6
Brandewynskuil	23¼	150 10 0
Mooifontein	21	132 0 0
Olievenfontein	46½	115 5 0
Zevenfontein	32¼	115 0 0
Eerstebegin	18¾	114 10 0
Goedehoop	10	110 10 0
Kuilfontein	34	99 15 0
Blesbokfontein	23½	89 10 0
Biesjeslaagte	17½	75 15 0
Rondevlei and Doornbult	21¼	62 10 0
Zwartlaagte	12¾	30 10 0
Goedgenoeg	9½	30 10 0
Maroetjesfontein	4½	26 10 0
Doornbult 153	22¾	22 5 0
Wildehoenderkraal	9¼	20 0 0
Vanzysdrift	4¾	15 10 0
Grootdoorns	3½	10 5 0
Homansvlei	2¼	8 5 0
Johannesrust	3	7 0 0
Wolvenspruit	1	6 0 0
Wildfontein	1½	5 0 0
Vaalbank	5	5 0 0
Smitskraal	1	2 0 0
Boschplaats	1¼	0 12 6
	4,695⅞	£19,234 3 6

FIGURES FOR SEVEN MONTHS.

For the past seven months the returns have been as follows:

January	3,063¾	£12,348 5 0
February	3,838⅜	16,167 2 9
March	3,865¼	18,159 0 0
April	4,196¼	18,415 6 6
May	4,226⅜	18,738 18 0
June	3,549⅝	15,984 17 6
July	4,695⅞	19,234 3 6
	27,435½	£119,047 13 0

BRITISH AND GERMAN COMMERCE AND INDUSTRIES.

Food Supplies of Both Countries—Increasing Foreign Trade Compared—Expert Opinion.

"In these days of close and active world commerce no important event which happens in one country can remain without its effect on the rest of the world." The foregoing words were written by Sir Edward Speyer for "England and Germany," in a review of the economic conditions of the two countries. That they are true is fully borne out by subsequent and prior events. It has become the custom to deplore the fact that most of the foodstuffs consumed in Great Britain are imported, and to lose sight of the equally important fact that nearly all great countries are in the same plight. German writers for some time past have taken exception to the cry from Great Britain that the expansion of the German fleet was explained by the intention of an attack upon England. It was recognised that sea supremacy for Great Britain was a matter of life and death, and it was urged that the possession of a strong fleet was equally necessary for the protection of Germany's commerce. The Director of the Deutsche Bank and a member of the Prussian Upper House (Herr Arthur Von Gwinner), in an article on English and German Economics, has stated that Germany produced sufficient food for six days only of the week, and that even if coffee, tea, petroleum, silk and cotton were eliminated there would still be a necessity to provide for one seventh of the German population. He added that so long as that state of affairs existed it would be necessary for Germany to possess a fleet sufficiently strong to protect the food imports. The same view has been expressed by others, from time to time, and it now remains to be seen what the position of the Germans will be since its fleet has not, so far, proved capable of defending its trade routes. It may possibly be able to depend upon Austria Hungary for any augmentation that may be required in its food supplies. It is not to Austria-Hungary that it can look to for a continuation of the very marked increase in exports that has been so noticeable since the early nineties. This increase in exports has been a matter of favourable comment in certain circles in Great Britain, but German politicians have drawn attention to the fact that fully 32 per cent. of those increased exports were in raw materials.

GERMANY'S RAW PRODUCTS.

A large proportion of Germany's raw products finds a market in Great Britain, where it is manufactured and re-exported. To such an extent does this importation and exportation take place that the opinion has been expressed that war between the two countries would be fatal to both. Herr Hugo Stinnes, in an article on "The Industrial Development of England and Germany," says that "natural development could not be restrained by violence, and an unfortunate war would in no way long restrain the two countries with their capable inhabitants and rich mines from industrial rivalry." Nevertheless, many writers, both German and English, assert that the aspirations of the two races are so economically similar that there should be no reason why the utmost friendship should not exist between them. A German writer in the book already referred to considers that "the fears of the English that they will be supplanted by the Germans in the domain of international trade, based on the latest developments and progress, are grossly exaggerated." He proceeds to demonstrate that England's expansion has not been jeopardised by the expansion of Germany. First of all, the writer (Dr. Gottfried Zoepfl) tabulates the positions of the United States and Germany as compared with England, and then adds it is misleading to measure the progress of Germany by taking the rate of progress of England during recent years. "Rivalry," he says, "goes on much faster in the early stages than after a certain limit has been reached."

THE BALANCE OF TRADE.

Some of the figures quoted by Dr. Gottfried Zoepfl are interesting, and go to prove that the increase of the imports, and with it the sum total of the deficit in the balance of trade, is relatively much greater in Germany than in England. In 1911 Germany's foreign trade amounted to £400,000,000, and that of England to £1,050,000,000. From 1904 to 1910 the percentage of the increase of the whole of English trade has risen from 2·1 per cent. to 10·8 per cent.; the imports from 1·6 to 8·6 per cent., and the exports from 3·4 to 13·9 per cent. In 1910 the exports attained £9 per head of the population—a sum never before reached. In Germany the average export per head has risen since 1870 from £2 15s. to £6 in 1910; the last figure comparing with that of England in 1895. The exports of Germany show an increase in 1910 of £42,000,000, England's of £52,000,000. The increase of exports from 1903 to 1910 signifies for England a surplus of £108,000,000, an increase of 46 per cent.; for Germany a surplus of £82,000,000, an increase of not much more than 51 per cent. A detailed examination of the trades of the two countries leads Dr. Gottfried Zoepfl to the conclusion that it is wrong to attribute the failures and critical years of the most recent period of development to German competition, which he ascribes as a phantom, a spectre. He points out that of the foreign trade that of her Colonies amounts in round figures to £358,000,000. From this he deduces the fact that Germany must seek an export market in every quarter of the globe for its surplus production, whilst England has already secured markets, and that England's international economic position is not threatened. Politicians in Great Britain who are wedded to the principles of Free Trade have impressed this upon the public for many years, but Tariff Reformers have taken a more gloomy view of the position, and recognise no limitations of trade, considering that as Germany's rate of increase in trade has increased by 5 or 6 per cent. more than that of Great Britain, the latter is being left in the race. It is pleasing to note that the German view is in the contrary direction

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Engineering Notes and News.

MINE RESCUE STATIONS RULES IN GREAT BRITAIN.—II.

Lessons for South Africa—Rescue Brigades and Ambulance Work.

ABERAMAN RESCUE STATION.

1. Application for membership must be made in writing to the manager of the mine, and before entering upon a course of training candidates must be medically examined as to their physical fitness for rescue work.

2. Members must not be less than 21 years of age and have worked for five years underground. They must be of regular and sober habits. (Men of a nervous or excitable temperament must not be chosen.) It is desirable that members, if not already qualified ambulance men, should arrange to receive instruction in first aid.

3. To become a qualified member of a rescue brigade, applicants must satisfy the instructor upon the following points, viz.: (a) Acquaintance with the construction and manipulation of the apparatus; (b) ability to perform two hours' rescue work in the gallery; (c) knowledge of the theory of mine gases and rescue work; (d) ability to find way underground by the aid of rough tracings. No person shall become qualified until he has attended 16 lessons at the rescue station, 10 of which shall have been occupied by practical work in the gallery with the use of the apparatus. A badge of efficiency will be given to each member who passes the above tests satisfactorily.

4. It is desirable that members of the brigades should be given opportunities for making themselves familiar with the workings of the mines at which they are respectively employed.

5. Colliery managers should see that their rescue brigade members attend for practices on the proper days.

6. The superintendent is responsible for the charge of the rescue station, all rescue equipment and for the proper training of all members of brigades.

7. Each member attending the rescue station for practice must report his arrival to the superintendent.

8. All equipment must be kept ready for immediate use in case of emergency, and no person must interfere with any part of such equipment at the station without first obtaining the authority of the superintendent.

9. Members are provided with dressing and waiting rooms, and are not allowed to enter the office, work room, engine room or equipment room unless authorised to do so by the superintendent.

10. Persons not engaged in practice work must not interfere with any door or window of the gallery, or any switch connected with the electric light or power.

11. Each man must carefully examine and test his own apparatus before using it. After use, and before leaving the station, the wearer must empty his apparatus and re-charge the oxygen cylinders.

12. Members practising in the gallery must keep together as much as possible and act in all ways as though performing actual rescue work in a mine.

13. Members must exercise care to prevent damage to their apparati, especially when passing through the small and difficult part of the gallery.

14. The whole squad must withdraw from the gallery through the nearest emergency door and report to the superintendent in the following circumstances, viz.: (a) If any one of the pressure gauges registers the minimum fixed by the superintendent; (b) if any member experiences any ill effects whilst wearing the apparatus. A record of all these cases must be kept at the rescue stations.

15. The member appointed leader of a squad must be responsible, so far as his own squad is concerned, for carrying out rules numbered 12, 13 and 14, and must examine every pressure gauge at intervals of 20 minutes.

16. Rescuers must attend practices once a week (unless otherwise directed) until they become qualified members, after which time they must attend at least once in every three months, or oftener if the committee of management consider it necessary.

17. The superintendent must keep a register of the names and addresses of all qualified members, and he must be notified of any change of address without delay.

18. Any member who has suffered from an illness must report the nature of it to the superintendent before commencing the first practice he attends after his recovery, and he must undergo a medical examination if the committee of management require him to do so.

19. The committee of management have power to suspend any member who misbehaves himself while engaged in rescue work or practice.

20. In the event of an accident at a pit at which assistance from the rescue station is desired, the superintendent should be communicated with at once, and the management of the colliery requiring aid must be responsible for supplying particulars as to the apparati and approximate number of men required to conduct the first rescue operations. If men are required, the superintendent must immediately ask managers of subscribing collieries to send the number of qualified rescue members required to the scene of the accident. The superintendent must then proceed with the rescuo car to the afflicted pit, gathering as many members as possible on his way

N.B.—To gain admittance to colliery premises after an accident has occurred it will bo necessary for rescue members to show their badges of efficiency to the police or other officials guarding the entrance.

21. A qualified member who has not attended a practice for twelve months previous to an emergency call must not take part in any actual rescue operations which necessitates the wearing of apparatus until he has practiced for at least two hours in the rescue station gallery.

22. Before entering a distressed mine, the apparatus of each rescuer must be carefully tested. Leaders of brigades must carry out these tests and see that the squads are properly equipped and only descend the shaft with their apparati fully tightened and in use.

23. The leaders of brigades must concentrate their whole attention upon the task in hand, examine the pressure gauges every 20 minutes, and keep a close watch upon the condition of their men and apparati.

24. Brigades entering distressed districts must proceed at a pace not exceeding that which is comfortable to the slowest man and must be extremely careful to leave ample oxygen for making the return journey.

25. It is of the utmost importance that the whole squad should keep together. Should circumstances necessitate the leader dividing his squad on no account must a man be sent to explore alone. The detached party must examine each others gauges every 20 minutes, as specified in rule 24

26. Should any man become distressed through any cause, the whole squad must return with him to safety at once.

27. One or two spare cylinders of oxygen must always be carried with each squad, and must be of similar design to those carried on th

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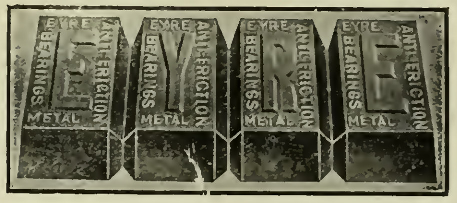

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apparati to enable them to be substituted for cylinders on the apparati worn in the event of any inadvertent loss of oxygen and also for reviving purposes.

28. No party must be away from the base of operations for more than one and a half hours without a fresh supply of oxygen, etc., being procured, and should they be required to explore a district which is unknown to them, the leader must take with him a plan of the district showing the direction of ventilation and the position of all doors, if possible.

29. Each party, when exploring after an explosion, must carefully examine the timbers and roof when on their forward journey, and should they find any collar, post or armbreaking, or any likelihood of a fall, they must not attempt to go beyond it until they have made it secure. They must always keep their line of retreat clear.

30. The Leader of each squad must clearly indicate the route he has taken by marking the timbers or roof with chalk arrows, and particularly distinct marks must be made at every junction of two or more roads.

31. No leader must take his men through any road of which the height or width is less than 18 inches without enlarging it or removing the obstacle.

32. The squad must time their return to a place of safety, so that half an hour's supply of oxygen shall be left in each man's apparatus after their return. This is intended to be a safety margin in case of unforeseen accidents happening to any member of a squad upon the return journey.

33. While one squad is at work, a second squad should get ready at the base to follow on in support or relief of the operating party.

34. The superintendent of the rescue station, or a suitable person nominated by him in writing, must be responsible for a sufficient supply of oxygen and other necessities being brought as near as possible to the rescuers. He or some other qualified person must be in charge of any base or bases of operation that may be established in the colliery later.

MINING MEN AND MATTERS.

At the annual meeting of the Witwatersrand Commercial Exchange held this week the committee's report was adopted and Mr. A. Macdonald (Loewenstein, Adams & Co., Ltd.) was elected chairman for the ensuing year, amid applause. Mr. Greer, the retiring chairman, was heartily thanked for his services in the past year. Mr. R. H. Philpot (H. Incledon & Co., Ltd.) was appointed vice-chairman, and the following Executive Committee was appointed:—Messrs. F. L. Cartwright (Union Iron and Steel Works), W. F. Croxton (African Indent Merchants, Ltd.), W. F. T. Harvey (Harvey & Russell, Ltd.), J. W. Kirkland (South African General Electric Co.), J. McG. Love (J. McG. Love & Co., Ltd.), Z. Marsh (British Mining Supply Co.), W. A. Martin (Parker Wood & Co., Ltd.), A. Y. Niven (Niven & Mitchell), W. B. Phelp (British General Electric Co., Ltd.), O. Fletcher (Moses Eadon & Sons, Ltd.).

Lisbon-Berlyn Closed Down.

The New Lisbon-Berlyn mine has been temporarily closed down, and its staff and employees absorbed by other properties of the Erhlich group.

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New Patents.

279. John Eglinton Montgomerie.—An improved process for sifting teff grass and millet seed.
280. Carl Gleiche.—Improvements in or relating to steering mechanism for motor ploughs.
281. George Tom Cannon.—Improvements in rope grips or jockeys for mechanical haulages and the like.
282. John William Birtley Craggs and William Campbell.—Improvements in jockeys or rope grips for mechanical haulages and the like.
283 Lancelot Ussher and Armour Hall.—Improvements in pipe and tube manifolds and the like.
284. George William Porter and Cyril Heyland Browne.—Patent.
285. Fabian Mercer Cox.—Jig concentrators.
286. Reginald Alfred Harris and Albert William Pearse.—Emergency tyre and means for attaching the same.
287. Harold Sharpley, Kenneth Norman Lambert and Richard George Hillier.—An improved means or apparatus for transporting granular and like materials.
288. John Christian Reul.—Carboline, a compound powder to prevent the formation of carbon in motor engines.
289. John Conrad Lind.—Improvements in and relating to the treatment of waste dumps of collieries to recover the products of combustion therein.
290. John Charles Leslie and Frederick Swift.—Spark arrestor for locomotives.

New S.A.R. Rolling Stock.

The following new rolling stock has been placed in service by the South African Railways: Four class 16 engines; three class M.C. 1 Mallet engines; one class 15a engine; ten first-class main line saloons; two first-class Johannesburg-Pretoria coaches; two first-class Pretoria suburban coaches; two dining cars; eighty-one four-wheeled, drop-sided sheep trucks; ten 50-ton hopper wagons; four narrow gauge cattle wagons; two bogie cylindrical tank trucks (lead lined).

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Finance, Commerce, and Industries.

Trade of German South-West Africa. During the last quarter of 1913 the imports into German South-West Africa were valued at 14,137,000 marks, and exports at 25,590,000 marks, a total turnover of 39,727,000 marks. Diamonds constituted the greater part of the exports, being 22,276,885 marks. Other items were copper ore, 2,215,900 marks; tin, 127,500 marks; skins, 184,500 marks; fish oil, 66,500 marks, and ostrich feathers, 51,600 marks. Three factories for preserving meat have recently been started in German South-West Africa, viz., at Swakopmund, Karibib, and Okahandja. At present the local markets absorb all the goods produced, but negotiations for creating an export trade have just started.

* * * *

The Moratorium. The following information as to the scope of the moratorium presently operating in the United Kingdom is published for general information:—A moratorium, proclaimed at the beginning of August, provided all bills of exchange other than cheques or bills demanding acceptance before August 4, 1914, shall be regarded as due and payable one calendar month after date of maturity, and be regarded as bills for the original amount increased by interest calculated from date of reacceptance to the new date of payment at the bank rate as at date of reacceptance. A further proclamation has since been issued extending the operation of the moratorium so that all payments due and payable before September 4th in respect of cheques, bills on demand, negotiable instruments, or contracts dated before August 4th, shall become due and payable one calendar month after the original due date, or September 4th, whichever date is later. In cases where payment is demanded and refused, interest shall be payable from due date at the bank rate as at August 7th. The moratorium does not apply to wages, salaries, maritime freights, obligations of persons outside of the United Kingdom, interest on trustee securities, bank notes, Government payments, workmen's compensation, or withdrawals of savings bank deposits.

* * * *

Commerce and the War. The monthly report of the Johannesburg Chamber of Commerce has the following, *inter alia*: Ocean Freights: The Union-Castle Mail Steamship Company notified, on the 10th inst., that the Conference Lines had decided upon an increase on outward rates of freight of 33⅓ per cent., on homeward freight of 25 per cent., and on coastwise rates of 33⅓ per cent. Your Committee has since been informed that the Government requested the High Commissioner in London to make representations to the Union-Castle Company in reference to these increases; Sir David Graaff has reported by cable that these representations have been sympathetically received and are under consideration. Trading with Germany: Questions arising out of the proclamation regarding trading with Germany have been under consideration, and your Committee has endeavoured to obtain information to meet the numerous inquiries of members. Captured Vessels: The Secretary for Finance, in answer to inquiries made of the Treasury as to the procedure for obtaining delivery of goods in vessels detained in Table and Simon's Bays and Durban as naval prizes, notified your Committee that Prize Courts have been established at Capetown and Durban, and that consignees should instruct their agents at these ports to make application to these Prize Courts for delivery of their goods. The Capetown Chamber also notified that consignees in Capetown had arranged to instruct counsel to appear before the Prize Court to represent them jointly and collectively—the expense to be borne by such consignees pro rata to the value of their cargo. The Capetown Chamber invited consignees in Johannesburg to co-operate with Capetown consignees in the manner proposed. Public Contracts: In regard to contracts contemplated by the Public Works Department, inquiry has been made of the Provincial Secretary as to the intentions of the Executive of the Province as to proceeding with such works. This information is particularly desired by firms interested in view of the necessity to arrange for indenting for the necessary material. An early announcement on this subject has been asked for. The Defence Forces: In view of the need having arisen for calling out the Defence Forces, your Committee desires to appeal to employers to treat as liberally as possible members of their staffs who are called upon to serve their country at this crisis.

* * * *

Trade of German Togoland. Owing to drought, the trade of German (now British) Togoland last year was bad: the exports fell from 11,600 tons to 7,100 tons in the case of palm kernels, and from 3,200 tons to 1,100 tons in the case of palm oil, from 165 tons to 90 tons rubber, and from 548 tons to 502 tons cotton. On the other hand there has been an increase in the output of the following products: cocoa from 283 to 335 tons, sisal hemps from seventeen to forty-three tons, maize from 334 to 2,492 tons. In the case of the last product, the fall in market prices has annihilated the increase in value which might have had the result of augmenting the quantities exported. The trade movement in Lome reached about twenty-seven million marks.

* * * *

"S.A. Mining Journal" Exchange. With the Stock Exchange closed, it has been represented to us that the time is opportune to offer facilities in our advertising columns for the purchase and sale of securities for cash. No speculative dealings, of course, are ever possible through the *S.A. Mining Journal* Exchange. But sellers who desire money for securities they hold, and buyers who desire securities at the present low prices, and are prepared to pay cash can usefully avail themselves of the *S.A. Mining Journal* Exchange. Write stating name of stock or share, the amount and the price required, together with a postal order for 5s. for each item announced, with a stamped addressed envelope. Announcements should reach this office by 5 p.m. on Thursday of each week to ensure publication in that week's issue.

* * * *

The *Morning Post* emphasises the great opportunity which exists for British manufacturers to secure German trade with South Africa, which amounts to three and a half million sterling per annum. The paper mentions that three-fourths of the musical instruments and nearly half of the electrical machinery imported into South Africa comes from Germany.

De Beers' Employees: Three Months' Work.

The following notice has been issued by the directors to the employees of the De Beers Consolidated Mines, Ltd.: "The company have now completed financial arrangements whereunder they are able to offer work for the next three months to all their employees, including those now engaged in keeping the mines dry, and in other such protective measures. The company regret that they cannot resume ordinary operations, but it is their intention to proceed with the extension of storm water drains, the construction of the tramway from Beaconsfield to Hull Street and Kenilworth Road, the overhauling and repairing of all machinery and plant, and a certain amount of underground development and shaft repairs. In making this offer it is understood that the contemplated scheme of rationing, referred to in the notice of the 13th of August, is abandoned, except in special cases, for instance, in the case of workmen who are ill. All those who avail themselves of this offer of employment will be paid half-pay—on the basis of pay which was being drawn when the works closed down—but no pay will be reduced to less than 7s. 6d. per day—while the pay of those who received less than 7s. 6d. per day will remain unchanged. It is proposed that this arrangement shall come into operation on Wednesday, the 26th of August, and all employees who desire to avail themselves of this offer are requested to report to their respective departments at the usual time on Wednesday morning, the 26th of August. Should the military pay of any employee serving in the Defence or other Force during the war be less than his half pay, the company will pay the difference."

"South African Mining Journal."

SPECIAL BANKING SUPPLEMENT.

Vol. XXIII., Part II., No. 1191.] SATURDAY, JULY 25, 1914. [Gratis.

CONTENTS.

	PAGE
South African Banking Progress	i.
South African Bank Shares as Investments	v.
South African Paper Currency Law Reform	vii.
A South African Bankers' Symposium	ix.
South African Banks and the Gold Reserve Question	xi.
National Bank of South Africa	xii.
Standard Bank of South Africa	xiv.
African Banking Corporation	xvi.
Natal Bank	xvii.
South African Bank Clearing Returns	xviii.
Colonial Banking and Trust Company	xix.
Netherlands Bank	xix.
Position and Prospects of the Rhodesian Land Bank	xx.

SOUTH AFRICAN BANKING PROGRESS.

Great Inherent Soundness the Outstanding Feature—Prosperity Reflected in Globular Figures—Growth of New Business—The Amalgamation Policy, Its Cause and Effect—The Outlook.

First among the chief business assets of South Africa must undoubtedly be reckoned her banks. Founded and financed mainly by British capital, they have returned profit to their owners and reflected credit on their organizers, while greatly enhancing, by their excellent management, the good name of commerce in this country. Other British Dominions beyond the seas, less happy in the control and guidance of their banks, have known the catastrophic consequences of that misfortune; and though this country has not entirely escaped, in its early days, some of the evils of unsound banking, its record in this respect compares most favourably with that of most other and older countries. South Africa, indeed, has reason to be justly proud of her banking institutions. Through the tension of war and the slackness of peace, the anxieties of crises and droughts and plagues, the big credit organizations of the country have not failed her. To-day in the comparatively smoother waters of steady progress and development, they are reaping their reward. A glance at the marshalled cohorts of statistics in the following pages will show the inherent soundness of the position. Profits, it is true, may to-day be below the temporary agglomerations of post-war days. But reserves are being steadily augmented; business on both sides of the balance sheet gradually extended; and the beneficent functions and services of banking popularized and made increasingly familiar throughout all classes in the Sub-Continent.

Factors of Progress.

Not all the many-sided activities of South African banking are dealt with in the following pages; but most of them it is hoped are covered, however inadequately. Some attempt is made, it will be seen, to set out as clearly as the non-technical may demand, the manifold and undoubted attractions of South African bank shares as investments. To the questions of depreciation and secret reserves the prominence is accorded that they undoubtedly deserve, and so rarely are given. Nor is mention omitted of the vexed question of gold reserves, upon which the whole fabric of Imperial credit, in the last resort, rests. For the Rand, indeed for all South Africa, the matter has, plainly, much more than an academic interest. In the globular totals of South African clearing house returns now, we believe, printed for the first time in the public Press, readers will find something in the way of millions to impress them and an object lesson in the magnitude of the everyday banking business of the country. An article is included on the complicated bank-note currency question and the need for reform in the laws of the several Provinces governing it. And how better can we round off this review of the more important phases of banking than by some quotations from the very lips of those first authorities on finance in the land the Chairmen of our leading banks? From their most recent speeches we have

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BALANCE SHEET, 31st DECEMBER, 1913.

Dr.

				£	s.	d.
Nominal Capital	£6.250 000	0	0			
Capital Subscribed:—						
309,705 Shares of £20 each	£6.194,100	0	0			
Called up £5 per Share				1.548,525	0	0
Reserve Fund				2,000,000	0	0
Notes in Circulation				1,119,131	10	0
Deposit, Current, and other **Accounts**				20,900,321	2	7
Drafts outstanding, Acceptances under Credits, and **Endorsements** on **Foreign Bills** negotiated				1,262,957	18	5
Customers Bills for Collection, per contra ..				2,572,682	1	0
Rebate on Bills not yet due				52,353	12	5
Profit and Loss				170,489	2	11
				£29,626,460	7	4

Cr.

				£	s.	d.
Cash in hand	£4,445,541	19	6			
Cash at Bankers, and at **call,** and **short notice**	£973,756	3	7			
				5,419,298	3	1
Remittances in transitû				687,470	4	3
Native Gold on hand and in transitû				46,375	16	5
Investments in Consols, Exchequer Bonds, Colonial Government and Municipal, and other Securities (including deposits of stock with the Union Government)				2,650,242	4	9
Bills of Exchange purchased and current at this date				4,637,063	19	3
Bills Discounted for and **Advances** to Customers after making full provision for Bad and Doubtful Debts and Contingencies				13,062,914	15	1
Customers Bills for Collection, per contra ..				2,572,682	1	0
Freehold Premises in London at cost, less amounts written off				60,000	0	0
Bank Property and Premises in South Africa and Hamburg at cost, less amounts written off ..				456,682	4	0
Furniture and Fittings				23,380	10	2
Stamps, Stationery and Open Policies				10,350	9	4
				£29,626,460	7	4

LIST OF BRANCHES.

CAPE OF GOOD HOPE

Aberdeen.
Adelaide.
Albertinia (Agency to Riversdale).
Alexandria.
Alice.
Aliwal North.
Barkly East.
Barkly West.
Barrydale.
Bayville (Agency to [illegible]).
Beaconsfield.
Beaufort West.
Bedford.
Berlin (Agency to King William's Town).
Bredasdorp.
Britstown.
Burghersdorp.
Butterworth.
Cala.
Caledon.
Calitzdorp.
Calvinia.
Cape Town.
.. Long St.
.. Plein St.
Carnarvon.
Cathcart.
Cofimvaba.
Ceres.
Clanwilliam.
Claremont.
Colesberg.
Cookhouse (Agency to Somerset East).
Cradock.
Darling.
De Aar.
De Doorns (Agency to Worcester).
De Rust.
Dordrecht.
East London.
[illegible]
Fort Beaufort.
Fraserburg.
George.
Graaff Reinet.
Grahamstown.

Cape of Good Hope—contd.
Hanover.
Heidelberg.
Hoetjes Bay (Agency to Vredenburg).
Hofmeyr.
Hopefield.
Hopetown.
Humansdorp.
Idutywa.
Indwe.
Jamestown.
Jansenville.
Joubertina (Agency to Humansdorp).
Kenhardt.
Kimberley.
King William's Town.
Knysna.
Kokstad.
Komgha.
Ladismith.
Lady Grey.
Laingsburg.
Loxton.
McGregor (Agency to Robertson).
Maclear.
Mafeking.
Malmesbury.
Matatiele.
Middelburg.
Molteno.
Mossel Bay.
Mount Frere.
Muizenberg.
Murraysburg.
Naauwpoort.
Oudtshoorn.
Paarl.
Pearston.
Peddie.
Petrusville.
Philipstown.
Port Alfred (Agency to Grahamstown).
Port Elizabeth.
Porterville.
Port St. John.
Prieska.
Prince Albert.
Queen's Town.
[illegible]
Richmond.

Cape of Good Hope—contd.
Riversdale.
Robertson.
Seymour.
Simonstown.
Somerset East.
Somerset Strand (Agency to Somerset West).
Somerset West.
Stellenbosch.
Sterkstroom.
Steynsburg.
Steytlerville.
Sutherland.
Swellendam.
Tarkastad.
Tulbagh.
Uitenhage.
Umtata.
Umzimkulu.
Upington.
Van Rhynsdorp.
Van Wyksdorp (Agency to Ladismith).
Venterstad.
Victoria West.
Vredenburg.
Vryburg.
Wellington.
Williston.
Willowmore.
Woodstock.
Worcester.

TRANSVAAL.

Balfour.
Barberton.
Benoni.
Bloemhof.
Boksburg.
Brakpan (Agency to Benoni).
Delmas (Agency to [illegible]).
Devon (Agency to [illegible]).
Ermelo.
Fordsburg.
Germiston.
Greylingstad.
Haartebeestfontein (Agency to Klerksdorp).
Heidelberg.

Transvaal—contd.
Johannesburg.
.. Eloff St.
Klerksdorp.
Krugersdorp.
Leslie (Agency to Springs)
Lichtenburg.
Lydenburg.
Middelburg.
Newtown (Agency to Johannesburg).
Pietersburg.
Platrand (Agency to Standerton).
Potchefstroom.
Pretoria.
Randfontein.
Roodepoort.
Rustenburg.
Sheepmoor (Ag. to Ermelo)
Springs.
Standerton.
Val (Ag. to Greylingstad)
Vereeniging.
Zeerust.

RHODESIA.

Bindura.
Bulawayo.
Eldorado.
Gatooma.
Gwelo.
Hartley.
Livingstone, N.W. Rhodesia
Marandellas (Agency to Salisbury).
Penhalonga (Ag. to Umtali)
Que Que
Salisbury.
Selukwe.
Sinoia (Ag. to Eldorado).
Umtali.
Umvuma.
Victoria.

NATAL.

Dannhauser (Agency to Newcastle).
Dundee.
Durban.
Estcourt.
Greytown.
Hatting Spruit (Agency to Dundee).

Natal—contd.
Krantzkop (Agency to Greytown).
Ladysmith.
Mooi River.
Newcastle.
New Hanover (Agency to Pietermaritzburg).
Pietermaritzburg.
Port Shepstone.

ORANGE FREE STATE

Bethlehem.
Bloemfontein.
Ficksburg.
Frankfort.
Harrismith.
Heilbron.
Jagersfontein.
Kroonstad.
Ladybrand.
Lindley.
Reitz.
Senekal.
Smithfield.
Vrede.
Wepener.
Winburg.
Zastron.

BASUTOLAND.

Maseru.

PORTUGUESE TERRITORY.

Beira.
Lourenco Marques.
Villa Fontes.

NYASALAND PROTECTORATE.

Blantyre.

East Africa and Uganda Protectorates.

Eldoret. Kampala.
Mombasa. Nairobi.

The Officers of the Bank are bound not to disclose the transactions of any of its Customers.

made bold to extract some weighty pronouncements on that ever-present preoccupation of the business man, the money outlook, and on other current topics of outstanding interest and importance with which they, better than most, are qualified to speak. And then following closely the lines laid down by our contemporaries and pioneers in this field, *The Statist* and the *Financial Times*, we have attempted to set forth the history, position and prospects of each and every one of our great South African banks. Figures may prove anything and nothing; but they may prove everything to the careful student of finance. Thus, the tables added to the separate and detailed account of each of our banking companies, show more clearly than whole volumes of prose, the rise and expansion of our banks, which has been at once a contributory cause and consequence of the rise of South Africa's general prosperity. The whole, it is hoped, will form a convenient and compendious guide to, and record of the facts about, our banks.

INVESTMENT DEPRECIATION AND GROWTH OF BUSINESS.

A word will suffice here about depreciation and the growth of banking business. A feature of late in connection with the operations of these institutions has been the very large number of new customers for whom accounts have been opened, and the total turnover is consequently increasing with great rapidity. It does not necessarily follow that the same ratio of profits is being maintained as hitherto, although there is no inherent reason why any important change should have taken place in this connection, while it is quite certain that the volume of business will continue, in the nature of things, to expand. In common with all other financial institutions holding large quantities of Stock Exchange securities, the South African banks felt the effect of dwindling prices for Stock Exchange investments of all kinds during 1913, but this process has, there is every reason to believe, run its course; in fact, the recovery which took place lately in the prices of all quoted securities has already wiped out a great deal of the paper losses previously sustained. The banks rely, of course, to a large extent upon the mining industry for business; they now, however, not only enjoy the benefit of a heavy import business, but in addition, farming and merchant interests are growing up which require banking facilities on a substantial scale. Not only so, but the number of settlers is being slowly augmented, and mainly by men of means, whose chief care is to keep themselves right with one or other of the several principal banks operating in this part of the world.

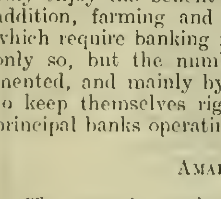
AMALGAMATION POLICY.

The ever-increasing competition for new business, though less noticeable in South Africa than in England, has brought about bank amalgamation on a big scale of late. The National Bank of South Africa, setting out to emulate its powerful rival, the Standard, has in turn acquired the National Bank of the Orange Free State, the Bank of Africa, and is now about to absorb the Natal Bank. The resulting combination will be in a position to measure forces with the Standard, and a rivalry similar to, though, of course, not quite so gigantic as, that between Lloyds Bank and the London City and Midland may result. It is, of course, too early to appraise the respective strengths of the competitors, but it is clear that the two big banks will divide the major portion of the business of the country between them, the A.B.C., which recently increased its capital, and the Netherlands Bank keeping the ring.

NEED FOR MORE CAPITAL.

The need for more capital is one of the most insistent features of the South African business world to-day. In supplying that need our banks by their enterprise, good name and stability can help most effectually. Some figures given by Mr. J. P. Gibson, the President of the S.A. Institute of Bankers, the other day cannot, in this connection, be too often quoted. He showed that the banking resources, including fixed and floating deposits and notes, within the Union, in 1908, were £31,900,000, and advances £22,000,000, giving a ratio of 69 per cent., while at the close of last year, five years later, resources had risen to £36,500,000, and advances to £32,500,000, the ratio being then 89 per cent. In the five years, therefore, there has been an increase of £4,600,000 in resources, and £10,500,000 in advances, with a resulting rise in the ratio of 20 per cent. These figures are eloquent, and prove that the Banks have done their utmost to render assistance, and help forward the development of the country; they also indicate the great need for more capital. Mr. Gibson also drew attention to the very small amount of new capital that had come to South Africa of late. Figures furnished by the *Economist* show that out of a total of £160,000,000 new capital raised in Great Britain last year for British possessions and foreign countries, only £6,294,700 was for South Africa, while Canada obtained £44,000,000, and Australasia £19,000,000. Surely it should be easy to divert to this country a larger share of that fructifying stream.

It is just possible that the eloquent figures and impressive thought-compelling facts appearing in the following pages may subserve a useful purpose by hastening the turn of the tide of capital to our shores. If so, the time and trouble devoted to the preparation of this work shall have been amply rewarded.


HEAD OFFICE: LOMBARD ST., LONDON.

LLOYDS BANK LIMITED.

Chairman: R. V. VASSAR-SMITH.
Deputy Chairman: J. W. BEAUMONT PEASE.

Capital Subscribed	£26,304,200
Capital paid up	4,208,672
Reserve Fund	3,000,000
Advances, &c.	50,871,240
Deposits, &c.	91,947,968

THIS BANK HAS OVER 650 OFFICES IN ENGLAND AND WALES.

Colonial and Foreign Department: 60, Lombard St., London.

PARIS AUXILIARY: LLOYDS BANK (FRANCE) LIMITED, 26, AVENUE DE L'OPERA.

THE NATIONAL BANK OF SOUTH AFRICA, LIMITED.

(With which is incorporated the BANK OF AFRICA, Ltd., established 1879, and the NATIONAL BANK OF THE ORANGE RIVER COLONY, Ltd., established 1877.)

Bankers to the Union Government in the Transvaal and the Orange Free State, and to the Imperial Government.

Subscribed Capital - -	£2,350,000	*Paid-up Capital - - -*	£2,350,000
With power to increase to	£4,000,000	*Reserve Fund - - -*	£700,000

Head Office: PRETORIA.

London Offices
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117, CANNON STREET, LONDON.

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General Manager: E. C. REYNOLDS.

LIST OF BRANCHES:

CAPE PROVINCE.

Adelaide.
Addo.
 (Agency to Uitenhage).
Aliwal North.
Balfour.
Bayville.
 (Agency to Uitenhage).
Cape Town.
 ,, Market.
 ,, Strand Street.
Cradock.
Dordrecht.
Douglas.
East London.
Grahamstown.
Griquatown.
Hankey.
Killarney.
 (Agency to Taungs).
Kimberley.
King Williams Town.
Kuruman.
Ladismith.
Mafeking.
Matatiele.
Middelburg.
Mossel Bay.
Murraysburg.
Oudtshoorn.
Paarl.
Port Alfred.
Port Elizabeth.
 ,, North End.
Prieska.
Prince Albert.
Queenstown.
Robertson.
Salt River.
Selborne.
 (Agency to Uitenhage).
Somerset East.
Springbok.
Steynsburg.
Stellenbosch.
Sydney-on-Vaal.
Tarkastad.
Taungs.
Taungs Station.
 (Agency to Taungs).
Uitenhage.
Uniondale.
Vryburg.
Warrenton.
Windsorton.

NATAL.

Durban.
Durban Point
 (Agency to Durban).
Ixopo (also known as Stuartstown).
Newcastle.
Paulpietersburg.
Pietermaritzburg.
Richmond.
Stuartstown
 (see Ixopo).
Umzinto.
Utrecht.
Vryheid.

ORANGE FREE STATE

Bethlehem.
Bethulie.
Bloemfontein.
Boshof.
Bothaville.
Brandfort.
Bultfontein.
Clocolan.
Dealesville.
Dewetsdorp.
Edenburg.
Excelsior.
Fauresmith.
Ficksburg.
Fouriesburg.
Frankfort.
Harrismith.
Heilbron.
Hobhouse.
Hoopstad.
Jacobsdal.
Jagersfontein.
Kestell.
Koffyfontein.
Koppies.
Kroonstad.
Ladybrand.
Lindley.
Luckhoff.
Marquard.
Memel.
Odendaals Rust.
Parys.
Paul Roux.
Petrusburg.
Petrus Steyn.
Philippolis.
Reddersburg.
Reitz.
Rosendal.
Rouxville.
Senekal.
Smithfield.
Springfontein.
Steynsrust.
Thaba 'Nchu.
Theunissen.
Trompsburg.
Tweespruit
 (Agency to Thaba 'Nchu).
Ventersburg.
Villiers.
Vrede.
Vredefort.
Warden.
Wepener.
Winburg.
Zastron.

TRANSVAAL.

Amersfoort.
Balfour.
Barberton.
Belfast.
Belgravia
 (Agency to Denver).
Benoni.
Bethal.
Bloemhof.
Boksburg.
Boksburg North.
Brakpan.
Breyten.
Bronkhorstspruit.
Carolina.
Christiana.
Cleveland.
Clifton (Braamfontein).
Comet (East Rand).
Davel (Agency to Ermelo.)
Denver.
Doornfontein.
Dullstroom.
 (Agency to Belfast).
Eastleigh
 (Agency to Klerksdorp).
Ermelo.
Fordsburg.
Germiston.
Harrisburg
 (Agency to Klerksdorp).
Haartebeestfontein
 (Agency to Klerksdorp).
Heidelberg.
Jeppestown.
Johannesburg.
 ,, Commissioner St. Central.
 ,, Commissioner St. East.
 ,, Joubert Street.
 ,, Market Square.
 ,, Pritchard Street.
Kinross
 (Agency to Bethal).
Klerksdorp.
Knights.
Koster.
Krugersdorp.
Lake Chrissie
 (Agency to Carolina).
Langlaagte.
Leeuwdoorns
 (Agency to Klerksdorp)
Lichtenburg.
Lydenburg.
Machadodorp.
Maraisburg.
Maquassie (Agency to Wolmaransstad)
Messina.
Middelburg.
Morgenzon.
Newtown
 (Johannesburg).
Nylstroom.
Oogies.
 (Agency to Witbank).
Ophirton.
Pietersburg.
Piet Retief.
Pilgrim's Rest.
Platrand.
 (Agency to Standerton)
Potchefstroom.
Potgietersrust.
Pretoria.
Randfontein.
Roodepoort.
Rooiberg.
Rosettenville
 (Agency to Ophirton).
Rustenburg.
Sabie.
Schweizer Reneke.
Springs.
Standerton.
Sterkwater
 (Agency to Potgietersrust).
Treurfontein.
Trichardts
 (Agency to Bethal).
Turffontein
 (Agency to Ophirton).
Val
 (Agency to Standerton).
Ventersdorp.
Vereeniging.
Vierfontein
 (Agency to Klerksdorp).
Volksrust.
Wakkerstroom.
Witbank.
Wolmaransstad.
Zaaiplaats
 (Agency to Potgietersrust).
Zeerust.
Zwartruggens
 (Agency to Koster).

PORTUGUESE TERRITORY.

Beira.
Lourenço Marques.
Macequece.

RHODESIA.

Bulawayo.
Gwelo.
Salisbury.
Umtali.

SWAZILAND.

Mbabane.

Agents at AMSTERDAM, BERLIN, HAMBURG, PARIS and NEW YORK.

Banking business of every description is transacted at all Branches.

Current Accounts opened on usual terms and **deposits** received for fixed periods at rates which may be ascertained on application.

Bills on all points Negotiated and Collected. **Letters of Credit** and **Drafts** issued and **Commercial Credits** established on all Branches and Agencies of the Bank in Africa and abroad. The Bank's **Travellers' Letters of Credit** are available all over the World.

Investment and Sale of all descriptions of South African and Foreign Securities effected, and **Dividends and Annuities** collected. **Strong Rooms** are provided for the Security of Deeds and other property lodged by Customers of the Bank.

Assay Department.—Gold, Tin and all Mineral Ores assayed and realised.

OFFICIALS OF THE BANK ARE BOUND TO SECRECY IN REGARD TO THE TRANSACTIONS OF ANY OF ITS CUSTOMERS.

SOUTH AFRICAN BANK SHARES AS INVESTMENTS.

Maximum Safety and Regular Dividends—How Securities Are Written Down—Liability on Bank Shares—The Question of Secret Reserves.

The growing interest of South African investors in the shares of the banks of the country has been one of the healthiest features of investment business during recent years. The shares of our leading banks are now regularly quoted on the stock exchanges of the principal towns of the Sub-Continent, and however true it may have been in the past, it is certainly now no longer true to describe South African banks as being owned entirely by oversea shareholders. Bank shares, of course, stand in a class by themselves; and the honourable history and excellent record of the great South African banks of to-day rightly distinguish our Bank shares as high grade investments. True, the kind of shares issued by our banks are generally limited to Ordinary shares, there being very few creations of Debentures or Preference shares, but in consequence of the very large margins of profits shown over dividend requirements and the size of reserve funds, the Ordinary shares of our banks stand on a different platform to those of most trading concerns. The profits of banks fluctuate, of course, according to the state of trade and the value of money, but in consequence of the persistent development of business that has gone on in such marked fashion since the introduction of the joint stock principle, the trend of banking profits has been steady for many years past, and steady rather than showy dividends are, of course, the aim of all sound banks. For some years past it has occasionally been urged against our bankers that they are apt to be too conservative in their methods of granting credits, but if that is the worst that can be said they can afford to bear the criticism, and for the sake of the responsibilities they assume on behalf of depositors and the public at large, bankers are unlikely to let such a criticism weigh upon them unduly.

Banks' Secret Reserves.

The special attraction attaching to Bank shares as a class rests in the knowledge that the liabilities are covered by tangible assets. Fancy valuations for goodwill, over-valuations of property (through neglect to write down sufficiently) and other questionable items that too frequently disfigure the balance sheets of industrial companies have no place in the balance sheet of a Bank. Ready convertibility of the assets into cash is one of the first maxims of banking. Not only are the disclosed reserves of our Banks very large, but the reserve strength is usually greater than appears from the published figures. There are various means by which Banks accumulate secret reserves. One of the most common is through the writing down of premises to a figure much below their real value. In this respect we may cite the noble lead that has been set to all Banks by the Bank of England, which does not take credit in its accounts to the extent of a penny piece for its enormously valuable site and buildings in the centre of the City of London that constitute a district in themselves. Another method of creating secret reserves is to over-estimate bad debts. This is a practice to which Banks resort in good years with a view to equalising profits, and we believe that it is partly on this account that the revenues of our Banks do not always show the fluctuations that might be expected from the wide ups and downs of trade. A third secret reserve lies in the difference between the book valuation and the market valuation of investment holdings. This brings us to the question of security depreciation that has been a thorn in the side of the banks for fifteen years past, practically since the war.

How Securities Have Been Written Down.

Being the largest corporate holders of Consols and Trustee securities, the fall in prices since the beginning of the present century has been a severe test of the financial stability of the Banks. The probability is that the Banks have now come to the end of the long period of writing down. By a strange coincidence Consols and other Trustee securities happened to be standing practically at the lowest levels ever reached when bankers made up their balance sheets at the end of last year. Hence the depreciation allowances were of a record character. Since then, as our readers are aware, there has been a sudden and substantial recovery in the Consol market, and, remarkable to relate, prices at the time of writing actually stand, as a rule, above the levels prevailing at the end of December, 1912. So that had the banks been in the habit of making up their books to the end of June, instead of the end of December, not only would they have found it unnecessary to write down their investments, but they could have reported that the book values were within market values.

Investments Valued Below Market Values.

When we recall the fact that seventeen English Banks alone have written down their securities by £2,360,600 on account of the year 1913, and that the South African Banks have followed suit, it will be seen that the Banks are now in a comfortable position with regard to their investments. They have, in fact, reverted at last to the pleasant conditions prevailing prior to the South African war—namely, having a secret reserve consisting of security values standing in the balance sheets well below market values. Taking Consols as one example, more than one Bank has publicly stated that it has written down the price to 71, whereas the current price is some 5 points higher. While, of course, this provision for depreciation has been necessary and unavoidable the process has greatly strengthened the internal resources of the Banks. It has to be remembered that the fall in Trustee securities has been a fall not in intrinsic values, but only in market values. Assuming, for the sake of argument, that a Bank has not sold any of the securities written down it is getting just as much income from them as before writing down commenced, while the amounts applied to depreciation have meant in bulk a huge addition to liquid resources and to earning power.

The Liability on Bank Shares.

One point of importance that must be considered by the would-be purchaser of Bank shares is the uncalled liability. The majority of Bank shares carry an uncalled liability, which forms part of the security available for the depositors and other creditors. There is always the possibility of a panic occurring that would involve a "run" followed by suspension and a call upon the shareholders, but under modern methods of banking the possibility is exceedingly remote. Moreover, it has not deterred small investors from buying Bank shares to an extent that might surprise a good many people apt to think of them pre-eminently as the rich man's investment. The varying character of the liability renders it necessary that intending investors in Bank shares ascertain first the exact degree of such liability in each individual case. Full particulars are, of course, always available and investors seeking for sound security returning regular dividends need not go further than the shares of any of our leading South African Banks.

African Banking Corporation,

LIMITED.

Authorised Capital - - -	£2,000,000
Subscribed Capital - - -	£1,200,000
Paid-up Capital - - -	£600,000

RESERVE FUND - £210,000.

Head Office:

63, London Wall, LONDON, E.C.

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STANLEY CHRISTOPHERSON, Esq.
SIR GODFREY YEATMAN LAGDEN, K.C.M.G.
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WILLIAM JAMES THOMPSON, Esq.
GEORGE WILLIAM THOMSON, Esq., J.P.

General Manager in South Africa - - - - - - - - (Resident at Capetown.)	**CHARLES LIPP.**
Agency in America - - - - - - - -	**64, Wall Street, New York**
Agency in Germany - - - -	**Bank of British West Africa, Ltd., Hamburg.**

☞ ***Branches in all the Principal Towns throughout South Africa, and Agents and Correspondents throughout the World.***

Every kind of approved Banking business is transacted at the Head Office and Branches. Current Accounts are opened, Drafts and Letters of Credit issued, Bills and Securities collected, the Sale and Purchase of Stocks, Shares, etc., undertaken and Securities and Valuables received for Safe Custody. Deposits for fixed periods are received on terms and rates to be ascertained on application.

Every Officer of the Bank is pledged to secrecy as to the business affairs of the Bank and its customers.

SOUTH AFRICAN PAPER CURRENCY LAW REFORM.

Anomalies of the Present Position—Need for a Uniform and Modern Paper Currency for the Union—Lessons from the United Kingdom.

In the deluge of new assimilating and codifying legislation that followed the consummation of the Union of South Africa, it was but natural that some important phases of the law should be overlooked. Amongst these none is more important than a measure making uniform the laws relating to the bank note issues of the four Provinces. To-day, although the banks doing business in the Provinces are the same, the note issues of these undertakings are governed by four different sets of laws. Of these, that governing bank note issues in the Cape Colony is notoriously the most antediluvian and unsuited to the needs of modern business conditions. The laws of the other Provinces are more businesslike, but the need for an assimilating law of liberal character is everyday becoming more marked. For instance, the Transvaal Bank Act (No. 2 of 1893), under which notes issued by the National Bank of the Transvaal were exempted from the provisions of the Act (Section 18), contains absurd restrictions. All the Provinces are now united under the Government of the Union of South Africa, and it is really necessary in public interests that both Ministers and members of Parliament should so study currency questions as to enable them to frame a measure which, while doing justice to banking institutions, will provide adequately for the rights of the taxpayer. They can best do this by providing that a first lien on all bank assets shall be the security for banknote issues, and that some percentage be paid to the taxpayer by the banks. Besides the first lien security the law on the subject adopted in the United Kingdom ought to be applied here, namely: " That a banking company claiming to issue notes is not entitled in that respect to limited liability, but continues subject to unlimited liability in respect to such issue " (Grant's treatise on the law relating to bankers). In this case, as in that of first lien, there is no loss of revenue whatever to the banks, as there is in the case of the absolutely unnecessary requirement of lodging Government stock against note issues.

The Present Cape Province Practice.

A study of currency legislation in Europe and of recent important developments in the United States is certainly desirable. The Hon. A. Wilmot recently advocated a Government note issue, based on the policy of convertibility on presentation. Taking, for example, he said, the circulation at three million pounds sterling, and keeping one million in the Treasury as a gold reserve, the Government would possess a loan from the people, for the people, of two million pounds sterling not bearing any interest; besides the value of each note destroyed or lost would go into the pockets of the taxpayers and not into those of shareholders in joint stock banks. For our part we do not favour any such scheme of State competition with banking business. The Bank Act of 1891 (Cape Colony) and the Transvaal Act (No. 2 of 1893) certainly should be repealed as soon as possible. One general comprehensive Act for the Union of South Africa is required, based upon the study of currency laws laid down by the best authorities, and their practical application by all civilised nations. In this connection we may cite the little known laws governing the issue of bank notes in the United Kingdom. In England the Bank Charter Act of 1844, of course, still governs the matter, and restricts the privilege to the banks of issue at that date. The Irish and Scotch Bank Acts, passed after the English Act, gave banks of issue more favourable terms than those given to the English issuing banks. The late Dr. Charles Gardiner, General Manager of the Union Bank of Scotland, in his notable paper on " The Constitution and Course of the Money Market " (1888), points out the Scotch and Irish advantages:—" Any expansion of notes in England," he writes, " beyond the amount authorised in the Act is necessarily an expansion of the note circulation of the Bank of England. In Scotland and in Ireland, on the other hand, the banks may increase their circulation to any extent in accordance with the public demand, provided that they have gold at their principal place of issue to an amount not less than the amount of such increase, ascertained, as I shall presently explain. . . . From the note department (of the Bank of England) no notes can legally be issued, even for an hour, in excess of the authorised amount, plus the coin in that department. It follows from this that a sudden demand for notes made on the banking department sufficient to exhaust their reserve will create a deadlock. In Scotland and in Ireland. . . . no such deadlock need take place, because any demand for notes, to whatever extent it may go, may be legally complied with, provided that on the average of four weeks, ascertained at the close of business on each succeeding Saturday, the issuing banks respectively hold at their principal place of issue, an amount of gold corresponding with the excess of issue beyond the authorised amount. Contravention of this provision would involve a certain pecuniary penalty on the offending bank " (Act of 1845, Section 23); " but contravention is improbable and unnecessary, because of the time allowed for strengthening the stock of gold through the principle of average over four successive weeks."

Note Issues and the Company Law.

It is also noteworthy that the Companies Act of 1879, "An Act to amend the law with respect to the liability of members of Banking . . . . Companies," contains, inter alia, a provision dealing with the liabilities of shareholders in banks of issue. It is enacted by Section 6 that "A bank of issue, registered as a limited company, either before or after the passing of this Act, shall not be entitled to limited liability in respect of its notes; and the members thereof shall continue liable in respect of its notes in the same manner as if it had been registered as an unlimited company; but in case the general assets of the company are, in the event of the company being wound up, insufficient to satisfy the claims of both the note-holders and the general creditors, then the members, after satisfying the remaining demands of the note holders, shall be liable to contribute towards the payment of the debts of the general creditors a sum equal to the amount received by the note-holders out of the general assets of the company. . . . It shall be lawful for any bank of issue registered as a limited company to make a statement on its notes to the effect that the limited liability does not extend to its notes, and that the members of he company continue liable in respect of its notes in the same manner as if it had been registered as an unlimited company." Though plainly a little cumbersome and old-fashioned, the laws governing bank note issues in the United Kingdom have worked satisfactorily all these years. Certainly, it ought not to be difficult from them to frame a liberal and uniform law for the Union. It is to be hoped the Union Government will put the matter high up on its agenda for the next session of Parliament.

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ESTABLISHED 1854.

Incorporated 1859, and now incorporated under The Natal Bank (Limited) Laws, 1888 to 1912 Private Act, 1912.

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HENRY BURRELL, ESQ.
J. ELLIS BROWN, ESQ., J.P.
WALTER GREENACRE, ESQ., J.P.
HON. A. T. OLIFF.
F. S. TATHAM, ESQ., K.C.

Auditors—MESSRS. G. J. MACFARLANE, C.M.G., J.P., AND W. J. O'BRIEN, J.P.
(Incorporated Accountants, Eng.).

General Manager - MR. H. R. CARRUTHERS.

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DURBAN. Sub Branch at POINT, Agency at PINETOWN.
EMPANGENI (ZULULAND).
ESHOWE (ZULULAND).
ESTCOURT, Agencies at BERGVILLE and WINTERTON.
GREYTOWN.
HARDING.
HOWICK.
LADYSMITH.
MOOI RIVER.
NEWCASTLE.
PIETERMARITZBURG, Agency at CAMPERDOWN.
STANGER.
STUARTSTOWN (IXOPO).
VERULAM.
VRIJHEID, Sub Office at HLOBANE.
WEENEN.

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HEIDELBERG.
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JOHANNESBURG.
KRUGERSDORP.
LOUIS TRICHARDT.
NIGEL.
PIETERSBURG.
PRETORIA.
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GEORGE H. RAW, Esq., and SIR WALTER PEACE, K.C.M.G.

Auditors—MESSRS. WHINNEY, SMITH & WHINNEY, Chartered Accountants.

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H. R. CARRUTHERS,
General Manager.

A SOUTH AFRICAN BANKERS' SYMPOSIUM.

Views of Chairmen at Recent Meetings—Lord Welby on Agricultural Progress—Hon. Hugh Crawford on the Outlook—Question of £1 Notes—Mr. J. P. Gibson on Prices and Gold Production.

Particular interest attaches to the speeches of the Chairmen of the leading South African joint stock banks at the general meetings recently held, owing not only to the unusual character of the past year's business, but to the uncertainty which prevails with regard to the future. That 1913 was a difficult year for bankers was admitted on all hands, and stress was generally laid upon the difficulties of conducting banking business during such troubled times. In London Sir Felix Schuster, of the Union of London and Smiths Bank, pointed out that for the whole year the Bank Rate did not fall below 4½ per cent., and it is necessary to go back as far as 1864 to find so high a minimum for the year. Mr. W. C. Alexander emphasised this side of the question, and stated that he considered, in looking back, that the City generally had many reasons to congratulate itself upon the satisfactory conclusion of one of the most trying and anxious times in its history; since, in spite of the unprecedented demands upon capital, and notwithstanding the very great depreciation which had occurred in securities, there had been no actual breakdown in credit. The question of depreciation has, of course, been a very important one for the banks everywhere, and the necessity for writing down their holdings still further has largely neutralized the extra profits earned.

Hon. Hugh Crawford on the Outlook.

The speech made by the Hon. Hugh Crawford, the Chairman of the National Bank of South Africa, deserves to rank with the best of those delivered by London bank chairmen. Speaking of the past year and of the immediate future, he said:—

> Referring to affairs oversea, it will be realised that while events in this country, during 1913, will alone have rendered the year a very difficult one for Bankers here, we also are affected by upheavals in the world generally. Monetary stringency in Europe, after being most pronounced, relaxed suddenly and somewhat unexpectedly last January, but prior to then the demand for money, accentuated by European wars and their consequences, as well as by general prosperity in trade made 1913 an abnormal year. It is always dangerous to prophesy, but, despite threatened trouble in Mexico, and the unsettled state of politics in Britain, hopes are entertained that we shall see an easier money market in the year before us. Having considered the principal influences affecting our field of operations, I venture to think you will agree that there is every reason for satisfaction with the results, and although the commercial horizon in South African is not altogether a clear one at the moment, we can, I feel, be confident that the next statement submitted to you will, at any rate, not be unfavourable. Our policy is to strengthen the position of the Bank in every respect, and while shareholders may have thought they were not participating sufficiently in the profits earned, their patience will be rewarded later. Without in any way binding the Bank, I think I can venture to predict a slightly larger dividend at the next distribution of profits.

Note Issues.

Some interesting remarks were also made at the annual meeting of the National Bank of South Africa, Ltd., by the Chairman, regarding South African note issues. The comparatively small amount of notes in circulation in this country is to be regretted as, if the public could be educated to use notes more freely, a considerable saving could be effected in the cost of transporting gold from one part of the country to another. The Hon. Hugh Crawford referred to the question of issuing £1 notes, and if the public antipathy to this denomination of paper money could be overcome, there would be a considerable reduction in the cost of supplying the currency requirements of the country. It is difficult to understand the prejudice which has hitherto existed against £1 notes.

Lord Welby on South African Progress.

A very able review of every branch of business activity was included in Lord Welby's speech at the last meeting of the Standard Bank. Discussing the progress of agriculture he said:—

> In past times the farmers, comparatively few in number, scattered over vast tracts, were attached to old ways, and had little stimulus to improvement. They were unprogressive; they were not in a position to co-operate for common objects, and the difficulties of transport and distance of markets did not encourage their energies. But in recent years a change for the better has taken place. Our inspectors, the eyes of the Bank, visit every year our 215 branches and agencies, and report on the state of the country which the branches serve. The general managers, too, from time to time, on more extended tours, give us a larger view, and I am happy to tell you that these reports are distinctly favourable. Unrest does not affect the agricultural districts. There is evidence of a progressive spirit gradually developing itself. The value of co-operation is appreciated, and it is aided by the Government. Farm properties are being developed, pumping machinery is erected, farms fenced, pedigree cattle introduced, and the drawbacks of which I have spoken are met in a manner which gives fair prospect for the future.

Mr. J. P. Gibson on Prices and Gold Production.

In his inaugural address as President of the South African Institute of Bankers recently, Mr. J. P. Gibson, the new Deputy General Manager of the Standard Bank, said, in regard to gold production and prices:—

> The output of gold is regulated by the cost of production, and while the standard price of the product does not alter, the costs of production, represented by cost of labour, power, equipment, and interest on capital, taxation, etc., rise and fall. As there can be no compensation in the way of an increased price for the gold produced, every rise in costs eats into the margin of payability, and if costs overtake and pass that margin, as has been the case in a number of our South African mines, the production of these particular mines ceases. Rising prices, therefore, mean a reduction in the profits of gold mining, and to counteract this influence the most strenuous efforts continue to be made to improve and cheapen the methods of mining and the processes of extraction, and these efforts have been rewarded with a fair measure of success. As regards the outlook for the future, there appears every possibility that the world's gold production will be maintained at a high level for the next 25 or 30 years, but after the first portion of that period has passed, the output of South African will, it is feared, decline in importance.

The same authority, speaking of the general position of business in South Africa said:—

> Considering the times we have passed through, the trade of the country has been fairly well maintained, though it is to be feared that many traders have had to give more extensive credit and are experiencing difficulty in getting in outstandings owing to the reduced spending power of the community, particularly in those districts which have suffered most from drought.

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SOUTH AFRICAN BANKS AND THE GOLD RESERVE QUESTION.

The Shortage of Gold—Royal Commission Suggested—How South Africa is Affected.

The controversy now raging in regard to the adequacy of the gold reserves of the London banks concerns the South African banks in several ways. First, all of them have big interests in the Rand mining industry, which is so intimately concerned in the supply of the metal; and, second, their credit is bound up with the whole fabric of Imperial credit which has its base and centre in London. It is contended by some critics that the position of the big London joint stock banks ought to be strengthened, as regards the quantity of gold held in the vaults of the banks themselves, exclusive of their balances with the Bank of England. This question is one which has been under discussion for some years past, and a Sub-Committee of the London Clearing Bankers has actually had it under consideration without apparently being able so far to arrive at any satisfactory conclusion. It is, of course, obvious that it is not to the immediate interests of bankers to keep more gold in reserve than they need. Coin in the bank vaults earns nothing and simply represents capital left idle as a safeguard against a time of trouble. There is thus every temptation to burke discussion on a somewhat delicate subject, for it is generally admitted that the total gold reserves held in Great Britain are small in comparison with the amount of liabilities.

Actual Gold Reserves.

Mr. J. H. Tritton, basing his figures on the report of the Deputy Master of the Mint, put the figure of the gold reserves actually held at the end of June, 1913, exclusive of gold bullion and foreign coin, at about £70,000,000; while the liabilities on current and deposit accounts of the English joint stock banks, exclusive of Scotland and Ireland, amount approximately to £860,000,000, in addition to about £250,000,000 due to depositors in the Post Office and Trustee Savings Banks. The matter has been brought to a head by the challenge of Sir Edward Holden, who announced at the meeting of the London City and Midland Bank that he and his fellow directors were so impressed with the importance of the question that they were prepared, unless some satisfactory arrangement be come to in the meantime, to publish in their next year's balance sheet the amount of gold they then held. This bombshell does not seem to have been generally welcomed, and it is doubtful whether, if the gold holdings of the London City and Midland be disclosed next December, the other banks will follow suit. On the other hand, if the controversy became acute, they might be forced to do so in the end. It is considered that a better alternative would be the appointment of a Royal Commission to consider the whole subject, which Sir Edward recommended.

A Currency Problem.

To what extent individual banks have strengthened their gold reserves during the past few years it is quite impossible to discover, and it is that which renders all reassuring statements as to the security of the position open to question by the critical and unbelieving. During the recent discussions on the subject it was suggested that gold reserves were really a matter of faith and not of works, and that to main-

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tain that faith concealment of the actual facts was absolutely necessary. Unfortunately in modern times faith is not such a powerful lever as it once was, and now that the suggestion that the British nation's gold reserves are inadequate has been put forward authoritatively it is difficult to see how it would be possible to prevent the matter being thoroughly thrashed out.

EXAMPLE OF FRANCE AND GERMANY

Another reason why it is advisable that the matter should be promptly taken in hand is afforded by the example of France and Germany. Both these countries have recently taken steps to very considerably increase their gold reserves. This was the result of the war scare which passed over Europe when the Balkan crisis was at its worst. It was then shown that enlightened democracies fully appreciated the risks run by leaving the control of their small available resources in other hands than their own—however good was the theoretical guarantee afforded—in times of national danger, and, as was said at the time, not only were there heavy withdrawals, but the gold so taken out seemed literally to sink into the earth and disappear. The Reichsbank, notwithstanding last year's monetary difficulties, is understood to have increased its holdings by twenty millions sterling, and the Bank of France is now engaged in further augmenting its already large stocks. In England the concealed reserves of the banks are larger now than they have been for some time past, and part of these might fairly be devoted to increasing their holdings of coin and bullion. South Africa in general, and the Rand in particular, cannot fail to be interested in the result.

NATIONAL BANK OF SOUTH AFRICA, LTD.

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Paid up, £10 per share (fully paid)	2,350,000
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The National Bank of South Africa, Limited, acts as bankers to the Union of South Africa, both in the Transvaal and Orange Free State. Its head office is in Pretoria. It was constituted in 1890, under a concession from the Volksraad of the late South African Republic, its name being changed in 1902 when the concession was abandoned and the continued incorporation of the Bank provided for by an Order in Council of the British Government passed in August, 1902. The concession fixed the capital at £1,002,000, in £10 shares, which included 200 Founders' shares, but in 1892 it was reduced to £1,002,000, with power to increase it to its former amount. A further reduction occurred in 1889 to £1,000,000, which was brought about by the cancellation of the Founders' shares, but it was immediately increased to £1,100,000 by the creation of 10,000 shares, the latter being issued in 1903, as to 5,000 shares to certain shareholders in lieu of the Founders' shares, 2,500 to shareholders in consideration of their waiving all right to cumulative dividend, and 2,500 to the Government of the Transvaal in consideration of its waiving all right to 20 per cent. of the surplus profits. During 1910 the National Bank purchased the business of the National Bank of the

LIABILITIES OF THE NATIONAL BANK OF SOUTH AFRICA, LIMITED.

Dec. 31.	Capital Paid up Amount.	Reserve Funds Amount.	Total Capital and Reserves Amount.	% of Total.	Notes in Circulation. Amount.	% of Total.	Acceptances. Amount.	% of Total.	Deposits, etc. Amount.	% of Total.	Profit Balance. Amount.	% of Total.	Total. Liabilities. Amount.
	£	£	£	%	£	%	£	%	£	%	£	%	£
1912	2,350,000	370,000	2,720,000	12·0	810,245	3·5	2,546,227	11·2	16,423,656	72·1	265,334	1·2	22,765,462
1911	1,100,000	70,000	1,170,000	8·5	521,421	3·8	1,237,534	9·0	10,669,320	77·5	168,808	1·2	13,767,086
1910	1,100,000	50,000	1,150,000	8·8	458,473	3·5	968,317	7·4	10,375,119	79·3	128,852	1·0	13,039,761
1909	1,100,000	50,000	1,150,000	10·7	250,373	2·3	603,338	5·6	8,681,811	80·9	50,871	·5	10,736,393
1908	1,100,000	140,000	1,240,000	15·6	245,020	3·1	600,532	7·6	5,796,116	72·9	67,637	·8	7,949,305
1907	1,100,000	140,000	1,240,000	15·9	215,136	2·7	595,944	7·6	5,701,208	73·0	62,362	·8	7,814,650
[illegible]	1,100,000	140,000	1,240,000	13·9	262,251	2·9	591,456	6·6	6,781,706	76·0	49,607	·6	8,925,020
[illegible]	1,100,000	[illegible]	[illegible]	12·2	292,075	2·9	628,367	6·3	7,821,485	77·8	75,796	·8	10,047,723
[illegible]	1,100,000	40,500	1,140,500	40·2	[illegible]	9·8	158,543	5·6	1,188,229	41·9	61,932	2·2	2,836,162
[illegible]	752,000	11,700	763,700	12·8	315,298	5·3	114,802	1·9	4,728,182	79·2	50,069	·8	5,972,051
[illegible]	[illegible]	2,700	[illegible]	[illegible]	99,372	4·9	39,974	1·9	1,345,781	66·2	12,503	2·1	2,033,413

ASSETS OF THE NATIONAL BANK OF SOUTH AFRICA, LIMITED.

Dec. 31.	Cash in Hand and with Bankers [illegible] Amount.	% of Total.	[illegible] Amount.	% of Total.	Money at Call and at Short Notice. Amount.	% of Total.	Bills Discounted Advances, etc. Amount.	% of Total.	Liability of Customers for Acceptances. Amount.	% of Total.	Capital Adjustment Account. Amount.	% of Total.	Bank Premises and Purchase Accounts. Amount.	% of Total.	Total Assets. Amount.
	£	%	£	%	£	%	£	%	£	%	£	%	£	%	£
1912	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	61·1	2,546,227	11·2	—	—	906,872*	4·0	22,765,462
1911	[illegible]	[illegible]	[illegible]	4·7	1,290,712	9·4	8,032,012	58·4	1,237,531	9·0	—	—	568,776*	4·1	13,767,086
1910	[illegible]	[illegible]	[illegible]	[illegible]	1,878,011	[illegible]	6,810,112	52·1	968,317	7·4	40,000	·3	568,825*	4·3	13,080,761
1909	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	37·8	603,338	5·6	40,000	·4	384,951	3·6	10,736,393
1908	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6·2	3,918,467	49·3	600,532	7·6	40,000	·5	395,609	5·0	7,949,305
1907	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4,357,407	55·7	595,944	7·6	40,000	·5	395,977	5·2	7,814,650
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4·1	[illegible]	51·1	591,456	6·6	40,000	·5	386,153	4·3	8,925,020
[illegible]	[illegible]	[illegible]	[illegible]	7·5	[illegible]	[illegible]	5,053,822	50·3	628,367	6·3	50,000	·5	381,620	3.8	10,047,723
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2·4	[illegible]	45·3	158,543	5·6	98,000	3·5	117,284	4·1	2,836,162
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,618,620	27·1	114,802	1·9	—	—	123,320	2·0	5,972,051
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	830,761	40·9	39,974	1·9	—	—	99,780	4·9	2,033,413

* Including balance of purchase account of National Bank of the Orange River Colony.

Orange River Colony—a business which had been in existence for over 32 years. The price paid was £20 2s. 9d. per share for the 20,000 shares of this Bank, or a total of £402,750. The purchase account has been written off by annual instalments, and on March 31st, 1911, had been completely written off. The paid-up capital remained at £1,100,000 until 1912, when arrangements were come to for the acquisition of the Bank of Africa, Ltd. The subscribed capital is £2,350,000 in £10 shares, which are fully paid, so that the issued capital is equal to the subscribed capital. The number of offices open at the end of 1911 amounted to 137, but with the absorption of the business of the Bank of Africa, which had 63 branches open and with the opening of other new branches the total number of offices open at 31st March, 1914, was 206. At the end of 1908 the bank had a reserve of £140,000, but owing to the continued depression in the value of landed property throughout South Africa, and with a prospect that better values were not likely to be secured within a reasonable period it was decided to transfer £90,000, from the reserve, leaving the balance consequently at £50,000, at which figure it remained until the end of 1910, when it rose to £70,000. From the profits of 1911 a total of £50,000 was added to the reserve, thereby increasing it to £120,000. But by reason of the acquisition of the Bank of Africa the reserve was substantially increased to £370,000, while a further £130,000 has been appropriated from the profits of 1912, thereby increasing the fund to £500,000. A further £200,000 was allocated on 31st March, 1911, bringing the total to £700,000. It will be recognised that this is a much more satisfactory position than was the case in 1910. The notes in circulation stood at £810,245 at the end of 1912, as compared with £521,424 the previous year. At the end of 1911 the deposits amounted to £10,669,320. The deposits of the Bank of Africa were £5,762,574, so that to all intents and purposes the deposits of £16,423,656 at the end of 1912 showed no change as compared with the previous year. On March 31st, 1914, they had risen to £16,675,284, a satisfactory increase of a quarter of a million. In the tables herewith we set out the liabilities and assets for various years from 1893.

As a consequence of the depression from which the country suffered it was decided to pay no dividend for 1908. For 1909 the net profits were £17,000 less than they were for 1901, but in view of there being no necessity to make further provision for contingencies it was possible to resume dividends, and a payment of 3 per cent. was made. For 1910 the net profits were more than three times those shown for 1909. Accordingly the dividend was increased to 5 per cent. There was also a sum of £20,000 carried to reserve and £40,000 was set aside to wipe out the balance of capital adjustment account, in accordance with the scheme of 1899. For 1911 the profits showed a further satisfactory advance, the net amount being £159,957, which justified the raising of the dividend to 6 per cent. For 1912 the gross profits showed a satisfactory advance over the combined profits of the two institutions working separately for 1911. In the following statement we set out the profit record of the past ten years:—

PROFITS OF THE NATIONAL BANK OF SOUTH AFRICA FOR TEN YEARS.

Year ended Dec. 31	Gross Profits.	Salaries and other Expenses.	Net Profits.	Dividend. Amount.	Dividend.	Reserve. etc.	Carried Forward.
	£	£	£	£	%	£	£
1912	710,653	422,399	288,254	140,858	6	173,500	19,833
1911	380,346	220,389	159,957	66,000	6	75,000	27,808
1910	289,622	177,643	111,979	55,000	5	65,000	8,851
1909	177,486	143,251	34,235	33,000	3	1,000	16,872
1908	199,025	147,750	51,275	—	Nil.	51,000	16,637
1907	205,926	160,171	45,755	44,000	4	2,000	16,362
1906	247,166	165,354	81,812	77,000	7	—	16,608
1905	260,950	154,124	106,826	88,000	8	20,000	11,796
1904	264,446	161,377	103,069	88,000	8	20,000	12,971
1903	280,863	144,040	136,823	88,000	8	45,000	17,902

The speech made by the Chairman, the Hon. Hugh Crawford, at the annual meeting in May last, struck a welcome note of confidence, despite the prevailing gloom. The features of the report are the facts that the last payment for the National Bank of the O.F.S. has now been made, and the excellent returns from all the branches of the National Bank itself, pointing—despite all we hear to the contrary—to satisfactory business conditions throughout the country. For the twelve months ended March 31, 1914, a net result of £411,171 was shown in comparison with £288,255 for the twelve months ended December 31,1912. This has been arrived at after very careful revision of the assets and making full provision for all estimated and ascertained losses. Out of the profit earned and the balance of £103,194 brought forward, a final dividend at the rate of 6 per cent. per annum is to be paid, and this, with the interim dividend declared on October 3, 1913, absorbs £176,250. It is further proposed that £200,000 be placed to reserve fund: raising it to £700,000, £30,000 to pension fund, and approximately £80,000 in elimination of the balance of the purchase price of the National Bank of the Orange River Colony, leaving a balance of £28,185 to be carried forward to next account—surely a very gratifying result for a difficult and "trying" year. The balance sheet likewise reflects progress under every heading, and the note circulation promises to be substantially increased by the re-introduction of a £1 note issue. Having considered the principal influences affecting the field of operations, and exhaustively reviewed South African commerce and industry in all their phases, the Chairman said: "I venture to think you will agree that there is every reason for satisfaction with the results, and although the commercial horizon in South Africa is not altogether a clear one at the moment, we can, I feel, be confident that the next statement submitted to you will, at any rate, not be unfavourable." With this reasoned expression of confidence in the progress of business, the Chairman very rightly coupled a warning to the fomenters of industrial unrest. He showed that the labour troubles of last year had had a very direct and serious effect upon trade, and it is to be hoped that his words will be taken to heart by those responsible for those troubles and their deplorable aftermath. In this, as in other respects, Mr. Crawford's address can be commended as a sane and dispassionate account of existing business conditions in this country, the causes of their purely temporary dislocation, and their real inherent soundness.

COMPARATIVE STATEMENT OF THE BANK'S POSITION FOR THE LAST TWO WORKING PERIODS.

	December, 1912.	March, 1914.
Capital paid-up	£2,350,000	£2,350,000
Reserve Fund	370,000	500,000
Notes in Circulation	810,245	793,130
Deposit, Current & other Accounts	15,814,577	16,675,284
Bills for Collection	2,546,227	2,760,827
Cash on hand, at call and short notice	3,538,506	4,100,129
Investments in Securities	875,870	1,052,,709
Bills of Exchange, Current	2,773,332	3,159,660
Discounts and Advances	11,191,546	11,279,217
Nett Profits	288,255	411,171

On the whole it will be seen that the last balance sheet shows the position of the bank to be one of great soundness. Since its issue the announcement of the forthcoming amalgamation with the Natal Bank has been made. The splendid position in which the combined resources of the two institutions will then place the bank need not be laboured. The general effect of the fusion is dealt with in our first article, and we need not attempt to anticipate here the detailed statements which the Chairmen of both banks will doubtless put before shareholders at the forthcoming special meetings.

STANDARD BANK OF SOUTH AFRICA, LTD.

History of the Institution—Remarkable Record of Progress in Half a Century—Impregnable Position of To-day.

Head Office: 10 Clement's Lane, Lombard Street, London, E.C.

CAPITAL—

Authorised	£6,250,000
Subscribed, 309,705 shares, £20 each	6,194,100
Paid up, £5 per share	1,548,525

Price of Share, £11¼ *Dividend*, 14 [illegible] *Yield*, £6 [illegible] 5d

The premier banking institution of South Africa is the Standard Bank of South Africa, Limited, which was established in 1862, nine years after the granting of representative institutions to the colony and ten years before the introduction of responsible government. In the prospectus of the Bank attention was drawn to the fact that the banking capital of the colonies had not kept pace with the increase of trade, and that "it has become clear that a new banking institution of considerable magnitude and with adequate resources is sure of public [illegible] and [illegible] [illegible] success." The capital of the new Bank was fixed at £1,000,000, in 10,000 shares of £100 each, with power to increase to £2,000,000. The first issue consisted of 5,000 shares. It may be added that the title was originally the Standard Bank of British South Africa, and it was not until January, [illegible], that the name was changed to its present form. The first report issued was dated October 2, 1863, and contained the results of the first half year's working. This enabled a dividend of [illegible] per share to be paid, which was equal to 12 per cent. on the paid-up capital. Moreover, a start was made with a reserve fund, £10,000 being set aside, though the whole of this did not come from profits, being partly received as premium on the issue of the shares. In their report the directors stated "that the most complete success has crowned our efforts and the prospects of the future are most encouraging." Quite early in the history evidence was afforded of the intention of the board to thoroughly cover the field of operations, and by the time that the Bank had been in operation twelve months as many as 17 branches were in operation in South Africa. Moreover, it was evident that business was steadily increasing, for it was decided to increase the capital by the issue of one new share for every two held, and the issue was made at a premium of £8 per share. By 1864 the Bank had 20 branches, of which 2 were in Natal and 3 in the Orange Free State. Soon after this the business of the Commercial Bank of Port Elizabeth was acquired, and also that of the Colesberg Bank. In 1880 the number of branches amounted to 50. By 1892 the number of branches had increased to 72, and by December 31, 1913, the number reached 214. Of this number 137 were in the Cape Province, 13 were in Natal, 17 in the Orange Free State, 35 in the Transvaal, 1 in Basutoland, 15 in Rhodesia, 1 in the Nyassaland Protectorate, 3 in British East Africa, 1 in Uganda, 1 in Zanzibar, and 3 in Portuguese East Africa. In addition to which there was the head office in London, and there is an agency in Hamburg and another in New York. The capital of the Bank was increased in 1862 to £2,000,000; in the following year a further increase occurred to £3,000,000, while in 1873, by the acquisition of the London and South African Bank, the paid-up capital rose to £600,000. By 1880 the amount paid up was £1,000,000, and by 1905 it has increased to £1,548,525, at which figure it still remains. The present authorised capital is £6,250,000, and at December 31 last the subscribed capital amounted to 309,705 shares of £20 each, making £6,194,100, and as £5 per share was called up this made the paid-up

LIABILITIES OF THE STANDARD BANK OF SOUTH AFRICA, LIMITED.

Dec. 31	Capital Paid up Amount	Reserve Funds Amount	Total Capital and Reserve Amount	% of Total	Notes in Circulation Amount	% of Total	Drafts Outstanding and Acceptances Amount	% of Total	Deposits, etc. Amount	% of Total	Bills Receivable Amount	% of Total	Profit Balance Amount	% of Total	Total Liabilities Amount
	£	£	£	%	£	%	£	%	£	%	£	%	£	%	£
1913	1,548,525	2,000,000	3,548,525	[illegible]	1,119,132	3·8	1,262,958	4·3	20,952,674	70·7	2,572,682	8·7	170,489	·6	29,626,460
1912	1,548,525	[illegible]	[illegible]	[illegible]	1,177,291	4·1	618,002	2·1	20,896,971	72·6	2,385,678	8·3	168,635	·7	28,775,102
1911	1,548,525	[illegible]	[illegible]	[illegible]	[illegible]	4·3	1,066,693	3·9	19,189,753	70·1	2,278,449	8·3	158,291	·6	27,367,183
1910	1,548,525	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,454,801	5·5	17,586,183	66·5	2,627,526	10·0	155,595	·6	26,435,741
[illegible]	1,548,525	[illegible]	[illegible]	[illegible]	[illegible]	3·8	1,538,816	6·0	17,323,149	67·2	2,386,012	9·3	115,252	·4	25,789,986
[illegible]	1,548,525	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,271,639	4·3	20,465,998	70·0	2,766,590	9·5	174,691	·6	29,249,666
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	691,095	2·9	16,978,865	72·5	1,873,840	8·0	176,038	·8	23,423,522
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5·6	518,389	3·8	8,918,169	65·5	1,749,303	12·9	104,275	·8	13,608,196
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,098,317	10·1	6,081,927	55·9	1,334,627	12·3	158,010	1·4	10,888,235
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	117,417	7·6	—	—	510,881	33·1	494,813	32·0	8,459	·5	1,545,920
[illegible]*	[illegible]	—	[illegible]	[illegible]	—	—	—	—	114,151	56·3	—	—	15,624	7·7	202,728

* June 30

ASSETS OF THE STANDARD BANK OF SOUTH AFRICA, LIMITED.

Dec. 31	[illegible] Amount	% of Total	[illegible] Amount	% of Total	Loans on [illegible] Amount	% of Total	Bills Discounted, Advances, etc. Amount	% of Total	Bills for Collection Amount	% of Total	Bank Premises Accounts Amount	% of Total	Total Assets, Amount
	£	%	£	%	£	%	£	%	£	%	£	%	£
1913	[illegible]	[illegible]	[illegible]	[illegible]	—	—	[illegible]	59·8	2,572,682	8·7	550,413	1·8	29,626,460
1912	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	16,844,725	58·5	2,385,678	8·3	556,522	1·9	28,775,102
1911	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	16,124,894	58·9	2,278,449	8·3	593,497	2·2	27,367,183
1910	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	14,530,630	55·0	2,627,526	9·9	597,429	2·3	26,435,741
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	13,415,216	52·1	2,386,012	9·2	599,665	2·3	25,789,986
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2·7	[illegible]	55·3	2,766,591	9·4	382,395	1·3	29,249,666
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10,946,208	46·7	1,873,840	8·0	220,573	·9	23,423,522
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7,216,240	53·0	1,749,303	12·9	196,192	1·5	13,608,196
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7,548,171	69·3	1,334,627	12·3	118,963	1·1	10,888,235
1870	[illegible]	[illegible]	—	—	—	—	1,370,011	88·6	—	—	46,490	3·0	1,545,920
[illegible]*	[illegible]	[illegible]	—	—	—	—	160,762	79·3	—	—	405	·2	202,728

* June 30

capital, as stated, £1,548,525. In 1870 the reserve fund amounted to £6,000, in 1874 it was £100,000, and in 1880 it was £503,994. In 1884 a transfer of £130,000 was made from reserve to contingent fund, but this was soon made good, and by 1899 the reserve touched £550,000. A rapid increase has occurred since that date, and at December 31 last the reserve totalled £2,000,000, in spite of the fact that in 1907 a transfer of £97,050 was made from the reserve fund to investment reserve account to cover depreciation in the price of investments and provide a margin beyond their market value. It will be seen that the reserve is £451,475 in excess of the paid-up capital. In June, 1863, the deposits were only £114,154, at the end of the following year they exceeded £472,000, by 1870 they were in excess of £500,000. During the ten years to 1880 the deposits were multiplied twelve times, amounting at the end of the latter year to over £6,000,000. In a further ten years they had increased threefold, amounting to nearly £17,000,000; between 1905 and 1909 a falling-off occurred, but from 1909 up to the present time a steady increase has taken place, and at December 31, 1912, the deposits were £20,896,971, as compared with £19,189,753 at the end of 1911, while at the end of 1913, they had increased to £20,952,674. Herewith we set out a summary of the liabilities and assets of the Bank for various years from 1863. On December 31 last the company's liabilities to the public amounted to £25,907,116, as may be seen from the following:—

Deposits, etc.	£20,952,674
Notes in circulation	1,119,132
Drafts outstanding and acceptances	1,262,958
Bills receivable	2,572,682
Total public liabilities	£25.907,446

The proportion of its assets to its liabilities to the public on this date were—cash in hand, with bankers, etc., 23·7 per cent., investments 10·2 per cent., and bills discounted, advances, etc., 68·2 per cent.

	Amount.	Proportion to public Liabilities (£25.907,446).
Cash in hand, with bankers, and at branches, native gold	£6,153,144	23.7%
Investments	2,650.242	10.2%
Bills discounted, advances, etc. .. .	17,699.979	68.2%

A proportion of 23·7 per cent. of cash to liabilities to the public is a very large one, and is due in part to the Bank having taken upon itself the greater part of the burden of providing a cash balance for South Africa, just as the Bank of Montreal does for Canada. The fact that the Bank has a note circulation of £1,119,000, and that it has to be ready to redeem its notes upon demand, also accounts in some measure for the largeness of the cash balance. Naturally the profit statement of the Bank reflects fluctuations in trade in South Africa, but it may be pointed out that in spite of the very severe depression which occurred in 1908 and 1909 it was not necessary to reduce the dividend below 10 per cent. The measure of the depression may be gauged from the fact that the net profits fell from £235,599 for 1907 to £151,198 for 1908. Since that time the conditions of trade in South Africa have materially improved, and, consequently, the Bank's profits have steadily increased. For 1910 the net profits were £260,680, for 1911 they further rose to £301,005, while for 1912 a further increase to £311,653 occurred. As already stated for 1909 the dividend was 10 per cent., this rate was increased to 12½ per cent. for 1910, while for 1911 a further increase to 13 per cent. occurred, which was followed by a rise to 13½ per cent. for 1912. Even so, however, the whole of the profits were not divided in the form of dividend, and sums totalling £260,000 were allocated during the years 1910, 1911 and 1912 to reserve, etc. A further increase in prosperity has occurred during 1913, and profits have risen to £920,012, which has enabled the dividend to be raised to 14 per cent., while £120,000 has been used for reserve, investment, depreciation, etc. Herewith we set out the profits for the past ten years:—

PROFITS OF THE STANDARD BANK OF SOUTH AFRICA, LTD., FOR TEN YEARS.

Year ended Dec. 31	Gross. Profits.	Salaries and other Expenses.	Net Profit.	Dividend		Reserve etc.	Carried Forward.
				Amount.	Rate		
	£	£	£	£	%	£	£
1913	920,012	581,364	338,648	216,794	14	120,000	52,093
1912	865,575	553,922	311,653	209,051	13½	100,000	50,239
1911	807,483	503,478	304,005	201,308	13	100,000	47,637
1910	724,250	463,570	260,680	193,565	12½*	60,000	44,940
1909	619,698	448,410	171,278	154,852	10	—	37,825
1908	597,196	445,698	151,498	170,338	11	—	21,399
1907	693,215	457,616	235,599	232,279	15	—	40,238
1906	740,524	470,650	269,874	247,764	16	23,000	36,919
1905	755,090	476,600	278,490	247,764	16	26,000	37,809
1904	777,489	484,603	292,886	278,734	18	41,000	33,083

* Tax free 1st half.

The proportion that the shown net profit for 1912 bears to the paid-up capital is 21·9 per cent., to capital and reserve combined 9·5 per cent., and to the total working resources 1·2 per cent. The meetings of the Standard Bank of South Africa, Limited, are always of an interesting character by reason of the fact that the Chairman invariably reviews in detail the condition of South Africa during the period covered by the accounts. At the meeting on April 22 Lord Welby, after referring to the labour conditions and the strikes, which did not appear to have had much adverse effect on the Bank's position, showed that the satisfactory profits reported were due in some measure to the remunerative rates obtainable for advances; but in connection with the satisfactory growth of net profits attention was drawn to the increase of working expenses. "The expansion of our business consequent on the development of the Dominion is costly, but it is a primary condition of our prosperity that we answer readily to a demand for banking facilities, and the high cost of living throughout the Dominion, of which I have spoken, adds, and must add, to our working expenses. This is one of the reasons which enforces upon us the policy of making our position as strong as possible, so as to maintain the reputation of the Bank as a thoroughly sound institution, and at the same time willing and able to respond to the legitimate demands of a growing community." As the Bank was formed in October, 1862, it is now 52 years old, and it will be seen from the figures that are given above that remarkable progress has been made during the past half century. The management has steadily worked on sound and conservative lines, and the Chairman claims that the directors will continue to be guided by this tradition of cautious and conservative management. "Great as the progress of the last 50 years has been, we may reasonably look forward to further progress in the future and to the maintenance of the strong position to which we have been so fortunate as to attain." Assuming a continuance of the satisfactory and wise management that has characterised the Bank in the past, there is no doubt that the prophecy of the Chairman will be amply fulfilled. At an extraordinary general meeting on April 22 it was decided to adopt the practice of holding only one meeting in the year in place of the two formerly held.

New Capital Applications in London.

The total of the new issues of capital in London during the first quarter of this year amounted to £108,605,000, which is a record for any single quarter. The previous highest amount subscribed in any one period of three months was £83,112,000, in the April to June quarter of 1910. Of the £108,000,000 supplied for the three months, £47,000,000 has been on behalf of British possessions. Out of this latter amount no less than £37,900,000 has gone to Canada and Australasia. South Africa has taken £5,521,000, but of this amount £1,750,000 is accounted for by the recent flotation of the Government and Pretoria Municipal loans, so that the amount of fresh capital raised for mining and other enterprise has been very small.

AFRICAN BANKING CORPORATION, LTD.

Steady Growth of Profits—Increased Paid-Up Capital—A Strong Position.

Head Office: 63 London Wall, London, E.C.

CAPITAL—

Authorised, 200,000 shares, £10 each	£2,000,000
Subscribed, 120,000 shares, £10 each	1,200,000
Paid up, £5 per share	600,000
Price of share, £5¼. *Dividend*, 8%. *Yield*, £7 1s. 7d.%	

The African Banking Corporation has now completed 23 years of existence, as it was formed in June, 1890. As shown above, the authorised capital is £2,000,000, in £10 shares; there have been subscribed 120,000 shares on which £5 per share has been called up, thus making the issued capital £600,000. The head office of the Bank is in London, and there are 40 offices open in South Africa. In 1895 while the paid-up capital was £297,615, there was no reserve fund, but since that date a substantial reserve has been accumulated, and at September 30, 1913, it amounted to £210,000. The Bank has an authorised note issue limited to the amount of the paid-up capital, and the actual note circulation amounted at the date of the last balance sheet to £240,300. The Bank usually keeps a fairly large proportion of its assets in coin, notes, cash in hand, at call and at short notice. In 1910 the proportion was as high as 27 per cent.; in 1911 the proportion was 23·3 per cent., but by September 30, 1913, it had fallen to 18·1 per cent. The smaller ratio last year was due to the general monetary stringency and was, so to speak, accidental. Formerly the financial resources of the banks were strengthened from time to time by the supply of capital found by the gold companies for the development of the mining industry. Of late, however, the mining industry has been very restricted in its expansion and practically no fresh capital for that purpose has been brought into the country. On the other hand, however, considerable development in farming has taken place, and as trade has generally been good there has been a strong demand for money. In the special circumstances of last year it is not surprising to find that the deposits of the Corporation fell from £5,532,701 to £5,399,604. The acceptances increased during the year from £286,554 to £325,697. We set out below a summary of the liabilities and assets for various years since 1895.

On September 30, 1913, the company's liabilities to the public amounted to £5,965,601, as may be seen from the following:—

Deposits, etc.	£5,399,604
Notes in circulation	240,300
Acceptances	325,697
Total public liabilities	£5,965,601

The proportions of its assets to its liabilities to the public on this date were—bullion and notes and cash at bankers and at call and short notice 20·5 per cent., investments 11·7 per cent., bills purchased 21·6 per cent., and loans and advances 49·0 per cent.

	Amount.	Proportion to public Liabilities (£5,965,601).
Coin and bullion and notes, etc.	£1,220,423	20.5%
Investments	696,487	11.7%
Bills purchased	1,286,580	21.6%
Bills discounted, loans and advances	2,921,469	49.0%

As a result of the general trade expansion during the past two years, and as the corporation has thereby been able to employ fully its funds, the profits have taken a substantial step forward, so that the corporation has been able to place a larger amount to reserve and pay a higher dividend. The gross profits for 1913 have amounted to £211,385, as compared with £200,306 for 1912, an increase of £11,000. As the expenses have only risen £7,000, amounting to £147,024, the net profits have risen from £60,307 to £64,361. The dividend has been increased from 7 per cent. to 8 per cent., which absorbs a sum of £32,000. The amount carried

LIABILITIES OF THE AFRICAN BANKING CORPORATION LIMITED, AT SEPTEMBER 30.

Year.	Capital Paid up. Amount.	Reserve Funds. Amount.	Total Capital and Reserves. Amount.	Total Capital and Reserves. % of Total.	Notes in Circulation. Amount.	Notes in Circulation. % of Total.	Acceptances. Amount.	Acceptances. % of Total.	Deposits, etc. Amount.	Deposits, etc. % of Total.	Profit Balance. Amount.	Profit Balance. % of Total.	Total Liabilities. Amount.
	£	£	£	%	£	%	£	%	£	%	£	%	£
1913	[illegible]	210,000	[illegible]	9·2	240,300	3·6	325,697	4·9	5,399,604	81·7	37,194	·6	6,612,795
1912	[illegible]	[illegible]	[illegible]	8·7	285,418	4·2	286,554	4·3	5,532,701	82·3	33,761	·5	6,723,334
1911	[illegible]	[illegible]	[illegible]	[illegible]	281,966	4·2	91,011	1·3	5,784,363	85·8	26,642	·4	6,743,982
1910	[illegible]	[illegible]	[illegible]	[illegible]	266,073	4·2	39,180	·6	5,470,800	86·2	30,452	·5	6,316,505
[illegible]	[illegible]	[illegible]	[illegible]	9·1	282,608	4·9	54,435	·9	5,012,436	84·7	23,759	·4	5,913,238
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	186,091	3·5	1,720	—	4,492,839	85·9	19,700	·3	5,243,950
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	241,091	4·7	67,143	1·3	4,286,572	83·1	21,795	·4	5,157,003
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	317,085	5·4	69,772	1·2	5,011,118	84·1	19,776	·3	5,957,751
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	244,431	4·2	40,150	·7	5,225,119	85·9	18,380	·3	6,078,300
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	109,946	2·9	20,064	·6	3,034,194	83·1	16,783	·5	3,650,997
1895	297,615		297,615	7·8	33,870	·9	12,693	·3	3,486,751	90·7	12,188	3	3,843,147

ASSETS OF THE AFRICAN BANKING CORPORATION LIMITED, AT SEPTEMBER 30.

Year.	Coin and Bullion and Notes and Cash at Bankers and at Call and Short Notice. Amount.	Coin and Bullion, etc. % of Total.	Investments. Amount.	Investments. % of Total.	Bills Purchased. Amount.	Bills Purchased. % of Total.	Bills Discounted, Loans and Advances. Amount.	Bills Discounted, Loans and Advances. % of Total.	Liability of Customers for Acceptances. Amount.	Liability of Customers for Acceptances. % of Total.	Bank Premises Accounts. Amount.	Bank Premises Accounts. % of Total.	Total Assets. Amount.
	£	%	£	%	£	%	£	%	£	%	£	%	£
1913	1,220,423	18·4	696,487	10·5	1,286,580	19·5	2,921,469	44·2	325,697	4·9	162,139	2·5	6,612,795
1912	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,931,149	43·6	286,554	4·3	156,166	2·3	6,723,334
1911	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,796,961	41·5	91,011	1·3	148,917	2·2	6,743,982
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	21·2	2,449,135	38·1	39,180	·6	148,266	2·3	6,346,505
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	20·1	2,216,906	37·5	54,435	·9	148,533	2·5	5,913,238
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,720		150,343	2·9	5,213,950
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,472,221	47·9	67,143	1·3	153,449	3·0	5,157,003
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	69,772	1·2	150,833	2·5	5,957,751
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,761,799	[illegible]	40,150	·6	150,188	2·5	6,078,300
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,354,378	37·1	20,065	·6	134,790	3·7	3,650,997
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	20·4	1,084,923	28·2	12,961	·3	86,932	2·3	3,843,147

to reserve is £25,000, and, after making sundry other allocations, there is carried forward a sum of £21,194, as compared with £17,761 brought into the accounts. The profit record of the past 10 years is as follows:—

PROFITS OF THE AFRICAN BANKING CORPORATION, LTD., FOR TEN YEARS.

Year. ended Sept. 30	Gross. Profits.	Salaries and other Expenses.	Net. Profits.	Dividend Amount.		Reserve, etc.	Carried Forward.
	£	£	£	£	%	£	£
1913 ..	211,385	147,024	64,361	32,000	8*	28,928	21,194
1912 ..	200,306	139,999	60,307	28,000	7*	29,188	17,761
1911 ..	172,732	130,663	42,069	24,000	6*	23,880	14,641
1910 ..	152,408	120,895	31,513	20,000	5	4,819	20,453
1909 ..	147,663	118,993	28,670	20,000	5	4,611	13,759
1908 ..	157,566	131,660	25,906	22,000	5½	4,001	9,700
1907 ..	167,768	135,643	32,125	24,000	6	6,106	9,795
1906 ..	167,153	137,783	29,370	24,000	6	3,974	7,776
1905 ..	160,560	139,958	29,602	24,000	6	3,867	6,379
1904 ..	189,565	147,041	42,524	24,000	6	23,323	4,644

* Includes income tax.

The proportion that the net profit bears to the paid-up capital is 15·1 per cent., as compared with 10·5 per cent. twelve months previously, to the capital and reserve combined the proportion is 10·3 per cent., and to the total working resources ·9 per cent.

As already pointed out, during the past year there has been a strong demand for money all over South Africa, and fresh capital is urgently required if the ordinary development of the country is to be steadily carried on. Naturally, as is the case with other countries, supplies of fresh capital have been exceedingly difficult to secure, and the result is that business has had to be restricted to a certain extent. At the meeting of the bank on January 8 the Chairman described the outlook as being fairly satisfactory in so far as the banking position was concerned, and he anticipated that the profits would be maintained.

At the end of February the board decided to make a further issue of 40,000 shares of £10 each to rank *pari passu* with the existing shares. The shares were offered to existing shareholders at par. Thus the paid-up capital is now brought up to £600,000, as compared with £400,000 at the end of 1913.

NATAL BANK, LTD.

History of the Bank—Fluctuations in Profits—Position Before Amalgamation.

Head Office: Pietermaritzburg.
London Office: 18 St. Swithin's Lane.

CAPITAL—

Authorised	£2,000,000
Subscribed, 174,116 shares of £10 each	1,741,160
Paid up, 25,884 "A" shares, £5 paid.. 148,232 "B" ,, £2 10s. paid	500,000

Price of "A" share, £5½. *Div.* 8%. *Yield*, £7 8s. 2d.%
"B" ,, £2½. *Div.* 8%. *Yield*, £8 3s. 3d.%

THE Natal Bank, Limited, was founded in 1854. It was incorporated in 1859, and is now incorporated under the Natal Bank Laws, 1888 to 1897. It acted as banker to the Colonial Government of Natal for many years, and has, since the Union, acted as banker of the Union Government in the Province. The head office is at Pietermaritzburg. For some years after its commencement it only had one branch, viz., at Durban, and for a long period the operations were confined to Natal, but, about 1885, branches were opened at Pretoria and Johannesburg, the London office being opened in 1890. At the present time there are 38 offices. The last time that the capital was increased was in 1902, when it was announced that the directors had determined to issue 86,305 new shares of the nominal value of £10 each, and to offer them by tender. At the present time the authorised capital is £2,000,000, in shares of £10 each. There have been subscribed 174,116 shares, and on 25,884 shares £5 per share has been paid up, and on the balance of 148,232 shares only £2 10s. per share has been paid, thus making the paid-up capital £500,000. The Bank has a note circulation the authorised amount of which is equal to the paid-up capital, it being a condition that specie equal to one-third of the notes is to be kept in circulation at the Bank. At the end of last year the actual amount in circulation was £121,303, as compared with £117,267 at the end of 1912. In 1893 the deposits amounted to £1,668,757, by 1895 they had nearly doubled exceeding £3,000,000, by 1905 they had risen to £4,333,688, and by 1910 to £4,871, 332. At the end of 1911 they fell to £4,518,755, the fall being chiefly owing to new financial arrangements made by the Government concentrating funds to a large extent in Pretoria. A considerable amount of Government balances which were formerly at the disposal of the Bank of Natal were transferred. During 1912, however, the business of the Bank showed a considerable increase and the deposits rose again to £4,734,792. In 1913 money was withdrawn for more profitable use in England, and the deposits fell back to £4,225,778. The amount of cash in hand at the end of 1913 was £1,060,301, as compared with £1,319,192 at the end of 1912. Herewith we show the liabilities and assets for various years from 1893. On December 31 last the Bank's liabilities to the public amounted to £5,056,127, as may be seen from the following:—

Deposits, etc....	£4,225,778
Notes	121,303
Bills for collection	501,321
Balances due to other banks	207,725
Total public liabilities	£5,056,127

The proportions of its assets to its liabilities to the public on this date were—coin and bullion, notes, etc., 20·9 per cent.; British Government securities, 3·7 per cent.; other investments, 1·3 per cent.; bills of exchange, 10·4 per cent.; and loans and advances, etc., 67·2 per cent.

	Amount.	Proportion to public Liabilities (£5,056,127).
Coin and bullion, notes, etc.	£1,060,301	20.9%
British Government securities	190.539	3.7%
Other investments	66,542	1.3%
Bills of exchange	525.333	10.4%
Bills discounted, loans, advances, etc. . .	3.399.265	67.2%

In so far as profits are concerned the Bank of late years has felt the depression in trade generally which followed as an aftermath of the war, and while up to 1905 the profits were sufficient to maintain the dividend at 14 per cent. per annum, for 1906 the rate fell to 12 per cent.; this was followed by a further fall to 9 per cent. for 1907 and to 8 per cent. for 1908, at which figure it has since been maintained. The worst year experienced by the Bank of late was 1908, when the gross profit amounted to £119,479, and the net profit to £39,974, as compared with £191,849 gross and £93,041 net for 1904. The most prosperous of recent years was 1913, when a gross profit of £149,657 was secured, and the net profit reached £55,638. The 8 per cent. dividend absorbed £40,000, while £15,000 was set aside to make provision for investment depreciation, and the carry-forward amounted to £14,803. In the following table we summarise the profits and distributions for the past ten years:—

PROFITS OF THE NATAL BANK, LTD., FOR TEN YEARS.

Year ended Dec. 31	Gross Profit.	Salaries and other Expenses.	Net Profits.	Dividend Amount.	Dividend Rate.	Reserve, etc.	Carried Forward.
	£	£	£	£	%	£	£
1913	149,657	94,019	55,638	40,000	8	15,000	14,803
1912	143,668	89,603	54,065	40,000	8	15,000	14,165
1911	138,900	84,184	54,716	40,000	8	15,000	15,100
1910	124,384	79,422	44,962	40,000	8	5,000	15,384
1909	128,055	78,369	49,686	40,000	8	15,000	15,421
1908	119,479	79,505	39,974	40,000	8	—	20,736
1907	132,606	85,128	47,478	45,000	9	2,000	20,763
1906	166,776	98,925	67,851	60,000	12	3,000	20,285
1905	184,405	99,571	84,834	70,000	14	15,000	15,431
1904	191,849	98,808	93,041	70,000	14	25,000	15,601

The proportion that the shown net profit for 1913 bears to the paid-up capital is 11·1 per cent., to capital and reserve combined 6·5 per cent., and to the total working resources ·9 per cent. At the annual meeting in February last the Chairman said that the reports from branch managers were generally satisfactory, indicating that the outlook, despite the effects of drought, strikes, and other obstacles to progress, was most encouraging. The Bank is now to be amalgamated with the National, and a special meeting has been called to lay the details of the proposal before the shareholders.

LIABILITIES OF THE NATAL BANK, LIMITED.

Dec. 31	Capital Paid up Amount.	Reserve Funds Amount.	Total Capital and Reserve. Amount.	Total Capital and Reserve. % of Total.	Notes in Circulation. Amount.	Notes in Circulation. % of Total.	Bills for Collection. Amount.	Bills for Collection. % of Total.	Deposits, etc. Amount.	Deposits, etc. % of Total.	Balances Due to other Banks. Amount.	Balances Due to other Banks. % of Total.	Profit Balance. Amount.	Profit Balance. % of Total.	Total Liabilities Amount.
	£	£	£	%	£	%	£	%	£	%	£	%	£	%	£
1913	600,000	255,000*	855,000	14·4	121,303	2·0	501,321	8·5	4,225,778	71·3	207,725	3·5	14,803	·3	5,925,930
1912	500,000	325,000	825,000	13·0	117,267	1·9	479,076	7·5	4,734,792	74·3	198,859	5·1	14,165	·2	6,369,159
1911	500,000	325,000	825,000	13·1	121,596	2·0	493,501	7·8	4,518,755	71·7	328,206	5·2	15,101	·2	6,302,159
1910	500,000	310,000	810,000	12·6	116,248	1·9	364,366	5·7	4,871,332	76·2	218,005	3·4	15,384	·2	6,395,335
1909	500,000	310,000	810,000	14·4	99,019	1·7	276,824	4·9	4,371,146	77·4	71,879	1·3	15,422	·3	5,644,290
1908	500,000	300,000	800,000	13·8	117,283	2·0	374,567	6·5	4,333,688	74·7	160,608	2·7	15,434	·2	5,801,580
1907	284,238	120,000	404,238	11·7	89,769	2·6	147,287	4·2	2,747,650	79·3	53,781	1·5	17,561	·6	3,460,286
1906	284,238	53,000	337,238	8·7	126,164	3·2	177,495	4·6	3,179,654	82·1	20,314	·6	34,664	·8	3,875,529
1905	284,237	40,000	324,237	10·1	60,414	2·8	131,500	5·9	1,668,757	80·0	—	—	26,513	1·2	2,211,421
1904	84,122	17,111	101,233	12·3	10,852	1·3	18,651	2·3	542,845	65·9	137,181	16·6	13,306	1·6	824,071

* Includes £30,000, special provision for depreciation of investments.

ASSETS OF THE NATAL BANK, LIMITED.

Dec. 31	Coin and Bullion Notes, etc. Amount.	Coin and Bullion Notes, etc. % of Total.	British Government Securities. Amount.	British Government Securities. % of Total.	Other Investments. Amount.	Other Investments. % of Total.	Bills of Exchange on Hand. Amount.	Bills of Exchange on Hand. % of Total.	Bills Discounted, Loans, Advances, etc. Amount.	Bills Discounted, Loans, Advances, etc. % of Total.	Bills Receivable. Amount.	Bills Receivable. % of Total.	Bank Premises Accounts. Amount.	Bank Premises Accounts. % of Total.	Total Assets. Amount.
	£	%	£	%	£	%	£	%	£	%	£	%	£	%	£
1913	[illegible]	[illegible]	[illegible]	[illegible]	66,542	1·1	525,333	8·9	3,399,265	57·4	501,322	8·5	182,628	3·0	5,925,930
1912	[illegible]	[illegible]	[illegible]	[illegible]	66,542	1·1	507,204	8·0	3,623,934	56·9	479,076	7·5	182,583	2·8	6,369,159
1911	[illegible]	[illegible]	[illegible]	[illegible]	66,542	1·1	509,954	8·1	3,585,519	56·9	493,501	7·8	183,838	2·9	6,302,159
1910	[illegible]	[illegible]	[illegible]	[illegible]	66,542	1·0	420,993	6·6	3,411,277	53·3	364,366	5·7	181,792	2·9	6,395,335
1909	[illegible]	[illegible]	[illegible]	[illegible]	66,900	1·2	380,962	6·7	3,260,941	57·8	276,824	4·9	181,317	3·2	5,644,290
1908	[illegible]	[illegible]	[illegible]	2·7	67,060	1·2	378,292	6·5	3,110,687	53·6	374,567	6·5	174,446	3·0	5,801,580
1907	[illegible]	[illegible]	—	—	269,061	7·8	106,369	3·1	1,521,747	43·9	147,287	4·2	68,228	2·0	3,460,286
1906	[illegible]	[illegible]	—	—	468,110	12·1	113,121	2·9	885,225	22·8	177,495	4·6	53,619	1·4	3,875,529
1905	[illegible]	[illegible]	—	—	111,026	5·1	—	—	1,419,821	64·2	131,500	5·9	53,101	2·4	2,211,421
1904	[illegible]	[illegible]	—	—	149,267	18·1	—	—	342,338	41·5	18,654	2·3	—	—	834,071

SOUTH AFRICAN BANK CLEARING RETURNS.

Figures that Reflect Business Activity.

[illegible]	[illegible] £	[illegible] £	[illegible] £	[illegible] £	[illegible] £
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	—	—
[illegible]	[illegible]	[illegible]	—	[illegible]	—
[illegible]	[illegible]	[illegible]	—	[illegible]	—
[illegible]	[illegible]	[illegible]	—	[illegible]	—
[illegible]	[illegible]	[illegible]	—	[illegible]	—
[illegible]	[illegible]	[illegible]	—	[illegible]	—
[illegible]	[illegible]	[illegible]	—	[illegible]	—
[illegible]	[illegible]	[illegible]	—	[illegible]	—
[illegible]	[illegible]	[illegible]	—	[illegible]	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

MONTHLY RETURNS, SECOND HALF OF 1913.

	Capetown.	Bloemfontein	Durban.	Joh'burg.	Pretoria.
	£	£	£	£	£
July	2,032,661	260,262	1,906,503	10,213,361	1,357,778
August	[illegible]	303,454	1,871,559	9,736,997	1,066,907
September	1,965,993	249,716	1,946,093	9,095,197	1,122,402
October	1,966,668	250,225	2,007,324	8,611,351	967,157
November	1,969,300	229,645	2,258,412	8,807,850	906,930
December	2,248,490	251,893	2,482,820	8,855,679	1,038,314
Total	[illegible]	1,565,200	12,472,711	55,320,435	6,449,488

MONTHLY RETURNS, FIRST HALF OF 1914.

	Capetown.	Bloemfontein.	Durban.	Joh'burg.	Pretoria.
	£	£	£	£	£
January	[illegible]	239,304	2,146,967	8,487,386	936,655
February	1,970,431	273,300	1,555,395	10,582,909	814,559
March	[illegible]	264,253	1,854,033	7,754,107	955,393
April	2,120,051	254,356	1,936,654	...	978,545

COLONIAL BANKING AND TRUST COMPANY OF AFRICA, LTD.

Though still in its infancy, the Colonial Banking and Trust Company, Limited, is an institution of great promise and vitality. Housed in the excellently situated block that was formerly the Robinson Bank, the Colonial Bank—as it has come to be popularly called—is gradually growing into a position of increasing usefulness. Though purely a local institution, with a local board, its Savings Bank Department, established four years ago, has attracted a wide *clientele*, upwards of 26,000 accounts having already been opened. Marked progress continues to be made in this side of the business of the Bank. In addition, practically every other description of banking business is done. Money orders, drafts and cable transfers are issued on all parts of the world and in all currencies. Foreign money is bought and sold. The Bank acts as agents for the Jewish Colonial Trust, Ltd., and for the Anglo-Palestine Company, Ltd. Fixed deposits are accepted, rates being quoted on application. A feature of the Savings Bank Department is the supply of home banks to customers for the purpose of making small savings at home. This is an innovation that is bound in time to become as popular here as it has in Europe and America. The London office of the Bank is at Egypt House, 36 New Broad Street, E.C., and the New York office at 10 Wall Street.

THE NETHERLANDS BANK OF SOUTH AFRICA.

Improved Position—Conservative Policy— Excellent Outlook.

Head Office: Amsterdam.
London Office: 2 Great Winchester Street, E.C.

Capital—

Authorised, 12,500 shares of £60 each	£750,000
Paid up, 4,000 shares of £60 each ...	240,000

Price of Share, 63%. *Dividend*, 4%. *Yield*, £6 7s. 6d.%

The Netherlands Bank of South Africa was registered as a limited liability company in Holland in March, 1888, but commenced its operations only in the beginning of 1889. It started by opening an office in Pretoria, which afterwards became the head office for South Africa. In 1890 a branch was opened at Johannesburg, and in the following year another one at Potchefstroom. At its registration the nominal capital was £200,000, consisting of £100 shares, of which £50,000 was issued and fully paid up. In 1889 and 1890 a further £50,000 and £60,000 of fully-paid shares were issued. The Bank continued its operations on this footing until 1895, when the nominal capital was increased to £400,000 with £250,000 issued, and since then its business has gradually extended. In Pretoria and Johannesburg new offices were found necessary and the Bank commenced putting up the large buildings on Church Square, Pretoria, and in Fox Street, Johannesburg, which were occupied in 1897 and 1896 respectively, and are still in use. About the same time a further issue of £50,000 capital was made and another branch established at Brugspruit, in the Middelburg coal district, which has since been transferred to Witbank. The next issue of £100,000 capital, by which the whole nominal capital of £400,000 was issued and paid up, was made soon after the war in 1903. The Bank, which in the past had confined its field of operations to the Transvaal, then established a branch at Capetown. In 1904 branches were opened at the Premier mine and at Witbank, and in 1905 a branch at Bloemfontein. At about that time the Bank also commenced to extend its European business by establishing an agency in London, which was opened in June, 1906. The head office has from the beginning been in Amsterdam. In 1910 the authorised capital was reduced to £750,000 in £60 shares, and the paid-up capital was reduced to £240,000 from £400,000. The deposits reached their highest point in 1909, when at the end of the year they were £590,000.

LIABILITIES OF THE NETHERLANDS BANK OF SOUTH AFRICA.

Dec. 31	Capital. Paid up	Reserve Fund.	Total Capital and Reserve.		Notes in Circulation.		Bills for Collection.		Deposits.		Profit Balance.		Total Liabilities.
	Amount.	Amount.	Amount.	% of Total.	Amount.	% of Total.	Amount.	% of Total.	Amount.	% of Total.	Amount.	% of Total.	Amount.
	£	£	£	%	£	%	£	%	£	%	£	%	£
1912 ..	240,000	24,000	264,000	32·5	23,109	2·8	61,741	7·6	448,011	55·1	16,162	2·0	813,023
1911 ..	240,000	20,000	260,000	28·6	22,630	2·3	51,017	5·5	562,363	61·6	16,690	1·8	912,700
1910 ..	240,000	17,000	257,000	28·1	21,434	2·3	50,006	5·5	573,942	62·7	13,287	1·4	915,669
1909 ..	240,000	17,000	257,000	27·7	19,194	2·1	49,050	5·3	590,077	63·6	11,962	1·3	927,283
1908 ..	400,000	45,722	445,722	45·5	18,037	1·8	31,926	3·3	477,714	48·7	6,752	·7	360,151
1907 ..	400,000	44,643	444,643	49·8	17,622	2·0	41,811	4·7	377,580	42·3	11,096	1·2	892,752
1906 ..	400,000	44,605	444,605	40·7	22,577	2·1	48,534	4·4	554,003	50·8	21,395	2·0	1,091,114
1905 ..	400,000	44,331	444,331	41·8	26,045	2·4	54,779	5·1	511,150	48·1	27,409	2·6	1,063,714

ASSETS OF THE NETHERLANDS BANK OF SOUTH AFRICA.

Dec. 31	Cash in Hand, with Bankers, and Money at Call.		Investments and Securities.		Bills Held for Collection as per contra.		Bills Discounted Advances, etc.		Property and Bank Premises Account.		Total Assets.
	Amount.	% of Total.	Amount.	% of Total.	Amount.	% of Total.	Amount.	% of Total.	Amount.	% of Total.	Amount.
	£	%	£	%	£	%	£	%	£	%	£
1912	133,440	16·4	60,321	7·4	61,741	7·6	488,891	60·1	68,630	8·5	813,023
1911	219,749	24·1	57,257	6·3	51,017	5·5	524,611	57·5	60,066	6·6	912,700
1910	189,399	20·7	57,114	6·2	50,006	5·4	533,992	58·4	85,158	9·3	915,669
1909	186,007	20·1	57,590	6·2	49,050	5·3	544,383	58·7	90,253	9·7	927,283
1908	160,231	16·3	57,536	5·9	31,926	3·2	689,675	70·4	40,783	4·2	980,151
1907	120,056	13·4	56,073	6·3	41,811	4·7	632,200	70·8	42,612	4·8	892,752
1906	163,547	15·0	52,351	4·8	48,534	4·4	782,107	71·7	44,575	4·1	1,091,114
1905	178,550	16·3	53,630	5·0	54,779	5·2	734,968	69·1	41,787	3·9	1,063,714

Since then they have declined to £118,000, which is, however, larger than they were in 1907. The Bank has a small note circulation. In the statement at the foot we set out the liabilities and assets for each year since 1905. On December 31, 1912, the Bank's liabilities to the public amounted to £532,861, as may be seen from the following:—

Deposits	£448,011
Notes in circulation	23,109
Bills for collection	61,741
Total public liabilities	£532,861

The proportions of its assets to its liabilities to the public on this date were—cash 25·0 per cent., investments 11·3 per cent., and discount and advances 91·7 per cent. The figures are as follows:—

	Amount.	Proportion to public Liabilities. (£532,861).
Cash in hand, etc.	£133,440	25.0%
Investments and securities	63,321	11.3%
Discounts and advances	486,891	91.7%

The Bank has followed a conservative policy, and during the times of depression and stress through which South Africa passed a few years ago in order to insure the safety of its deposits it stopped paying dividends from 1906 to 1909 inclusive. Moreover, its capital has been cut down from £[illegible],000 to £240,000. For 1889, 6 per cent. was paid; for 1890, 3 per cent.; for 1891 to 1893 inclusive, 4 per cent.; for 1894, 5 per cent.; for 1895, 6 per cent.; for 1896 and 1897, 5½ per cent.; for 1898, 5 per cent.; for 1902 and 1903, 7 per cent. each; for 1905, 3 per cent. For 1910 the rate was 4 per cent., a rate which has been maintained for each of the past two years. The gross profit for 1912 was £55,503. The expenses were £40,030 and the net profit £15,473. The 4 per cent. dividend has required £9,600, while of the balance £3,000 has been carried to reserve, bringing it up to £27,000, and £2,950 has been transferred to the internal reserve for depreciation of fixed property. The sum carried forward is £613. The profit record for the past eight years is as follows:—

PROFITS OF THE NETHERLANDS BANK OF SOUTH AFRICA FOR EIGHT YEARS.

Year ended Dec. 31	Gross. Profit.	Salaries and other Expenses.	Net Profit.	Dividend.		Reserve, etc.	Carried For-ward.
				Amount.	Rate.		
	£	£	£	£	%	£	£
1912 ..	55,503	40,030	15,473	9,600	4	5,590	613
1911 ..	53,984	37,981	16,003	9,600	4	6,400	690
1910 ..	51,138	37,851	13,287	9,600	4	3,000	687
1909 ..	49,161	37,200	11,961	—	—	11,961	—
1908 ..	46,477	39,724	6,753	—	—	6,753	—
1907 ..	54,070	42,974	11,096	—	—	11,096	—
1906 ..	62,035	40,640	21,395	—	—	21,395	—
1905 ..	62,560	35,151	27,409	12,300	3	15,409	—

The proportion that the shown net profit bears to the paid-up capital for 1912 is 6·5 per cent., to capital and reserve combined 5·8 per cent., and to the total working resources of the Bank 2 per cent.

POSITION AND PROSPECTS OF THE RHODESIA LAND BANK.

Points from Recent Annual Report.

The report and balance sheet of the Rhodesian Land Bank for the year ended December 31, 1913, were submitted at the annual general meeting recently held in London, Mr. R. Littlejohn, chairman of the company, presiding. The share capital subscribed and fully paid up stands at £175,000, leaving £75,000 for future issue. To meet the rapid development of the business in Rhodesia a loan at 5 per cent. had been obtained from the British South Africa Company amounting to nearly £[illegible], and this has been increased during the first five months of 1914 to a total of £[illegible]. The loans granted to farmers, which are in all cases for specific agricultural purposes, and repayable by instalments within fixed periods, stood at £227,434 on December 31st, and, despite two consecutive bad seasons, the borrowers had, with very few exceptions, met their engagements with a punctuality which promised well for the future. During the year no case of insolvency had arisen amongst them, and there were no bad debts. The small amount of interest and instalments in arrear reflected credit both upon the judgment and discretion of the manager and upon the substantial position of the farmers assisted by the Bank. The capital advanced to farmers had been applied in the following proportions:—Purchase of land, [illegible] per cent.; discharge of existing charges, 23.24 per cent.; purchase of livestock, plant, etc., [illegible] per cent.; improvements, 18.14 per cent.; total, 100 per cent. Thirty-four dipping tanks had been erected during the year with funds lent by the Bank. The gross revenue for the year was £[illegible], and after providing for all expenses of management and interest on the borrowed capital, the net revenue was £4,137. Out of this sum the preliminary expenses incurred at the outset have been written off, and £[illegible] has been carried forward. The financial stringency and high rates of interest which have prevailed in London would make it impossible for the directors to lend capital on first mortgage at 5 per cent. unless the British South Africa Company had been willing, in the interests of the Rhodesian farmers, to grant large temporary loans to the Land Bank in this early stage of its operations.

DEMAND FOR CAPITAL.

Farmers in other countries are paying far higher rates, [illegible] per cent. in Canada and [illegible] per cent. in Argentina. The ability of the Land Bank to continue and expand its operations, while maintaining these favourable terms, will depend partly upon current rates of interest in London but largely upon the punctuality with which borrowers meet their obligations, and the avoidance of losses through insufficiently secured loans. The experience of the past two years has shown how great is the legitimate demand for capital among Rhodesian farmers for genuine and remunerative agricultural developments. It is clear that as land settlement extends this demand must far exceed the present resources of the Land Bank. In the interest, therefore, of the community, it is the aim of the directors to conduct the Land Bank on principles which will convince British investors that capital advanced through its agency to Rhodesian farmers will be a safe mortgage security. To attain this object the business of the Land Bank must be conducted under the limitations laid down at the outset, and without regard to personal or administrative considerations, since the present rate of interest allows no margin for bad debts, and any laxity in the payments of interest or capital must be covered by higher rates and thus penalise other borrowers. For this reason the manager is only empowered to make loans to industrious and reliable farmers owning their land and farming it to good purpose. The advances must be for definite objects and be satisfactorily secured. They must be applied to the purposes specified. Finally the interest and instalments of capital must be punctually met and a net return of 5 per cent. must be earned. On the other hand, the farmer who fulfils his contract not only obtains needed capital at the lowest rate and within minimum expense, but he is enabled to reduce his debt by easy instalments (or more rapidly if he chooses), and he is secured against any increase of interest or demand for repayment in times of financial stringency. The directors had received testimony from various quarters as to the benefits the Bank has afforded to enterprising farmers, and provided the affairs of the Bank continue to be conducted on the present sound and economical lines, there is every reason to anticipate that its operations will continue to expand to the benefit of its clients—the farming community in Rhodesia. The report and accounts were approved and adopted, Sir Lewis Mitchell, C.V.O., the retiring director, being re-elected.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

July 28. National Diamonds (special).
July 31. Booysens Estate; Middlevlei Estate (annual).
Aug. 10.—Jumpers (Special).
Sept. 1.—Jumpers (Special).
Sept. 18.—Transvaal G.M. Estates (annual).
Sept 25. Sub Nigel; Simmer and Jack Proprietary (annual).

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